The Builder.

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The Economy of the Working Man's Abode.

PROMISE for the future is given by the attention which is now directed to the provision of comfortable and healthy abodes for the working classes. It will be of interest for those concerned in this important subject in England to glance at what is the state of the same question on the Continent. A Sicilian engineer, Signor Pietri Bonaccorsi, has communicated papers on economical houses for working men to two recent numbers of the Milanese architectural and industrial journal, *Il Politechnico*, from which we propose to take such items of information as are but little known in this country, while omitting such references to English practice as may naturally be more familiar to our own readers than they appear to have been to Signor Bonaccorsi.

The Parliament of Belgium is said to have been the first that occupied itself in any serious attempt to improve the condition of the dwellings of the workmen. In 1838 that assembly appointed a commission for the investigation of the subject; and in 1845 it allotted a credit of 80,000*l.* for the purposes of improvements in buildings of this nature.

Italy was not long in attempting to follow the examples set by Belgium and Great Britain. Florence was the first of the hundred cities of Italy to comprehend the importance of the subject. In 1848 a company was formed by philanthropical citizens of Florence, to which many members of the nobility subscribed. The municipality offered an ample area of land on very moderate terms; and a large building, covering 3,406 square mètres of ground, was erected by the company.

In 1860, the citizens of Milan, in emulation of those of Florence, instituted a building company, to which, in the following year, the communal Council granted gratuitously a free area of from 7,800 to 8,000 square mètres, for the purpose of constructing large houses for workpeople. Later, in other cities, such as Naples, Turin, Genoa, &c., efforts of the same nature have been commenced by private individuals, and more or less liberally aided by the Municipal authorities.

In France, in 1849, on the initiation of the President of the Republic, the first *Cité ouvrière Napoléon* was commenced. In 1852 the Government gave the sum of 400,000*l.*, as a subvention to a company formed for the construction of a new workman's quarter in Paris; and in the following year building societies were formed at Marseilles, Mulhouse, Lille, and Rouen, as well as other companies at Paris, all of which received the support of the Government.

It is unnecessary for us to enter into any detail of the sanitary questions involved in the housing of the workman. In England the subject is, fortunately, not new. In France and Italy, on the contrary, the idea of the advantage to human life and health, secured by properly ventilated sleeping apartments, is a subject that has come before the public attention with almost the novelty of a revelation. The scope, the Italian Building Societies have to insist, of their operations, is solely the welfare of the workpeople, in procuring for them cheap, commodious, and healthy abodes.

Domestic life in Italy is conducted on lines very different from those with which we are familiar in this country. From the Alps to the Ionian Sea stretches a country which is the very cradle of architecture—at all events, of domestic architecture. Stone admirably adapted for building purposes is in most regions accessible. Limestones of every quality, suitable either for ordinary or for hydraulic mortar, abound. The form of bricks, which is unchanged from the times of the Roman Empire, or even of the Roman Republic, and which is between that of an English brick and an English tile (as may be seen at St. Albans), is well adapted to make the most enduring work, when laid in the unexceptionally excellent mortar which is made in every part of the Italian peninsula. The type of the workman's home in Italy is thus not the hut, but the garret, cellar, or other small apartment of a palace.

Thus it was laid down in the first instance as the rule for the new working-men's houses that they must offer, at a low cost, well-constructed, ventilated, lighted, airy apartments, with doors and windows that properly close, with good kitchens, fitted with the convenient stoves, which are common where charcoal is the fuel mainly in use, with chimneys (a convenience frequently wanting in Italian houses, as, for example, in the Royal Palace at Naples, where iron tubes often make their appearance in the winter), sinks, drains, lavatories, wells, fountains, great courts, sometimes enclosing trees,—in fact, with all that is needful for healthy life, and for that degree of personal comfort which is desired even by the poorest. We have, in England, yet to be educated to a considerable extent in order to find the command of a shady court, furnished with a fountain, or at all events with a deep well of ice-cold water, needful for the poorest. But in Italy we tread everywhere on the traces of an ancient and most elaborate civilisation, and of a state of society in which, while the basis was slavery, or a state of ascription to the soil little differing from slavery, there was an inordinate wealth and command of the luxuries of life possessed by the great, which was directed, in a great measure, to the provision for their dependents of things which to us seem stately luxuries, but which the heat of the Italian summer leads men to regard almost as necessities. While in northern climates shelter from rain and snow is the first demand of the workman, in Italy he requires breathing-room, and shade from the rays of the sun.

In addition to a view of the requisites for the health and comfort of a workman's home which is so much higher (at all events on paper) than any framed in Great Britain, a great principle of social economy has been contemplated by the founders of the Italian building societies,—a principle, we may add, which is receiving very full illustration in certain admirable institutions amongst ourselves. The Building Company, or Society, of Mulhouse, was one of the first which attempted, in France, to secure to the working man, in a short time, and at cost price, a habitation which should be his own property, and to do that without inflicting any loss on those who came forward to aid him.

In Italy the effort has a scope and a meaning which will not be grasped by many English readers without explanation. Perhaps the most firmly based of Italian Institutions is the lottery. Its advertisements are in every publication, in every street. Its drawings are weekly. Its subscriptions may be as low as five *grani*, or about twopence of our money. Week after week the workman lays his subscription on the counter of the lottery office. And if any dream that can in any way receive a numerical interpretation have visited him, he will leave there every coin he can collect. We call this mode of investing his savings gambling, pure and simple. The Italian philanthropist, while admitting the demoralising effect of the institution, calls it a sacrifice made by the working man in the hope of bettering his afflicted condition. Call it what we like, we must all agree that if the weekly dole were invested in a building society, instead of in the lottery, it would be an improvement of very great importance. And there is this to be said in favour of the Italian building societies. There is a reality and visibility about their operations which appeals with much more force to the confidence of the timid and suspicious peasant than any savings-bank or similar institution can hope to do. The house is even more tangible than the lottery. What to an English workman would be the chief advantage of the building society, the certitude of its outcome, would not, in all probability, prove so attractive to the Italian as a brilliant chance. He would prefer raffling for a house, for instance, 250 times, to making an equal number of equal payments, at the termination of which the house would be his. At the same time, it is indisputable that there is here to be found an element of success and of popularity for the building societies of Italy.

Economical abodes for the working classes must satisfy three indispensable requisites. These are, solidity, salubrity, and economy. Solidity is attained by the preparation of good natural or artificial foundations, by the use of the best materials, and by the adoption of modes of construction regulated by the teaching of

science and the light of experience. Salubrity requires a good situation, fresh pure air, ample light, and (happy Italian workman!) a pleasant view, with a judicious distribution of all the portions and details of the building. Economy requires the absence of mere ornament, the choice of a site at a moderate price, in the neighbourhood of good building materials, and the employment of skilful and honest workmen. It will be seen how far less complicated is the question of site in the vicinity of most of the Italian cities, than is the case with regard to our own metropolis, or great centres of industrial life. The Italian writer admits that economy, as regulated by the price of site, and central position, are irreconcileable. The finger is here put on a difficulty which is very formidable in Great Britain.

In applying the principles thus laid down to the special case of the city of Catania, Signor Bonaccorsi first considers the four quarters, or *Frazioni*, into which that area is divided by the two main cross-roads called the Strada Stesicoro-Etnea and the Strada Lincoln; and then enters on a survey of the available sites to be found in each district, paying particular attention to the prevalence of the three dominant winds, the Maestro, the Levante, and the Ponente, and their respective qualities. We may take this as a hint to ourselves, to avoid an exposure to the north and east alone, where choice of outlook is allowed to the architect.

The various systems of workmen's houses constructed in the various parts of Europe may be grouped in three classes. These are (1) isolated houses; (2) grouped houses; (3) houses including many residences. Those of the first and second groups readily satisfy the requirements of health and those of convenience; but they can only be economically constructed where land, as well as labour and materials, is cheap. Favourable examples of this arrangement may be cited at Birmingham, where the hundreds of acres of small, mean, brick houses, stretching in intersecting lines beneath a canopy of smoke, would, however, form a very appropriate representation of the *Inferno* to an Italian workman, or even to a Neapolitan lazzarone. The second system is said to have answered well at Mulhouse, Marseilles, Lille, Rouen, Kuchen in the kingdom of Wurtemburg, and other towns, where immense quarters have been constructed, covered with a network of streets, terraces, gardens, and courts, and enriched with baths, lavatories, infant asylums, schools, reading rooms, and churches.

In Italy, in Paris, and in Berlin, where land, labour, and materials are all dear, the compound house, or building including many residences, has been adopted. It did not need the dictum of the architect Cantalupi to show that edifices composed of many separate parts, of small proportions, are always more costly than those in which the different parts are so grouped together that the entire structure may be carried to a great height. But this economical perception may be held to underlie the general architectural design of most of the buildings of Italy.

We are thus prepared to find that the type selected by Signor Bonaccorsi is purely Italian, with such modifications as may be suggested by the peculiar conditions of Catania, as regards the climate, the position, and the habits of the locality. But little attention has been given to certain accessories of less importance, on the ground that the workman, accustomed to toil, does not require the same accommodation as the rich citizen or the noble. At the same time it must be admitted that the designs recommended insure the desired requisities of solidity, salubrity, and economy. From an English point of view, they do more. The principal and the lateral elevations figured, though of extreme simplicity, are not devoid of a certain architectural dignity. This is attained by simple features, not attended with extraordinary expense in a country where stone is so accessible as in Italy, but the absence of which condemns a huge building to present a mean and poverty-stricken appearance. Even in brick buildings, the main lines of shadow may be produced, by due care, by oversetting. The elevation consists of four principal stories, with an attic range. A projecting cornice or fascia runs at the top of each story; that immediately below the attic windows being twice as bold as the lower members. The windows come down to the line of string course, and their height is three-fourths of that of the story to which they admit light. Their width is the half of the height of the lower windows; and the aperture of each is defined by plain jambs and architraves with a width of about one-sixth part of that of the aperture, the thickness being such as to throw a definite shade line. The general elevation is divided into three blocks, of which the centre is about six-sevenths of the width of each of the two externals; and the quoins of the outer blocks are defined by projecting pilasters, which are rusticated on the ground story. The pitch of the roof is low, and the projection of the eaves above the attic story is the same as that of each of the three fascias below the upper cornice. Cantilevers are shown on the fascias below the jamb of each window; and on the central block they are also interspaced along the whole line of string-course. A light railing, bounded by piers supporting lamps, reaches on either side the entrance to the side block. The effect of these simple architectural provisions, which break up the general mass into harmonious and well-proportioned parts, is admirable. The cost can be but small.

The above is a broad description of the elevation. Signor Bonaccorsi says that the design presents the aspect of a civil house of the third order. The form of the plan is a rectangle, isolated from the street, of which the lower side measures 44·30 mètres, and the smaller 27·80 mètres; thus the area inclosed is equal to 1231·54 square mètres, or 1,474 square yards. A large central court opens on the street on the principal side, and gives light to all the interior rooms. The total height, from the level of the street to the little cornice of the attic plane, is 17·50 mètres, divided into five planes or stories, of the several heights of 4·50, 4·00, 3·80, 3·00, and 2·20 mètres. (There can be no doubt that much of the good effect of the elevation depends on this just gradation.) The pitch of the roof allows a mean height of 3 mètres, and a maximum height of 3·70 mètres to the attic story.

The system of construction is that which is ordinarily adopted in houses of good quality, and the material used the best afforded by the vicinity. The external walls, on the ground line, have a thickness of 0·80 mètres, and the internal walls a thickness of 0·50 mètres. This diminishes story by story, the external arches being reduced, in the attic plane, to 0·50 mètre, and the internal to 0·25 mètre. All the walls of less thickness than 0·40 mètres are of brickwork, set in mortar; and the small subdivisions are of brickwork, set, in the Sicilian fashion, in cement. The doors, balconies, and windows have their jambs and architraves wrought in calcareous stone. The same material is used for the cornice, the fascias, the pilasters, the corbels, the window-cills, the projecting floors of the balconies, and the cills of the doors. A stylobate of lava forms the base of the edifice, and the sills of the doors on the ground-floor are of the same material. The corbels and frames of the windows in the court-yard are of lava, covered with stucco. (It should be remembered that stucco in Sicily has only a very distant relationship to what goes by the same name in England.)

The steps of the staircase (again we say, enviable working-men of Sicily!) a mètre in length, are of white marble.

Light iron rails protect the stairs and the balconies. An iron grille with a gate closes the principal entrance to the building. The roof is framed in wood, and covered with common tiles. The ground floor and three succeeding stories are covered with arches in pumice stone and *gesso*; and the attic has a ceiling under the tiles. The floors of the rooms are of flooring tiles; the shops on the ground floors are paved; the court-yard is paved with lava. The doors and windows are such as are commonly used in Catania.

For the internal arrangement the rooms are placed in double rows, each being directly illuminated. Entrance is given by a balcony, or landing, reached by staircases from the court. There are fifteen residences on each floor, composed, some of two, others of three rooms. The larger rooms are five mètres by four; the smaller, four mètres square. The internal rooms all average the same size. The air contained in each room is sufficient (Signor Bonaccorsi thinks) to supply the respiration of eight persons for an entire night of ten hours, and in the larger rooms twelve persons might sleep for that time without any fear of suffocation, there being two ventilators to each room. This opinion can have a shadow of correctness only on the supposition that the ventilators are large and always left open,—as they would not be in England. The same number of fifteen residences is arranged on each story; the attic rooms being reduced in order to allow a narrow internal passage to replace the open balcony which gives access to the first, second, and third floors. The entrance to the inner room or rooms is in each case through the accompanying outer room.

Each residence is provided with a water-closet, in the English fashion, with a marble seat, and with drains. There is a provision of a fire-place with a chimney on the Harel system, and also a small lavatory for washing, and a small cistern. Potable water is supplied by leaden pipes on every story, allowing a sufficient quantity for the consumption of ten persons to each residence. When the geological conditions admit there will be at least one well in the court-yard. The rain will be conducted so as to aid in cleansing the drains.

As the lowest mean monthly temperature of Catania does not fall below 51° Fahr., it is unnecessary to provide for warming. In case of need, use may be made of the chimneys provided for cooking. The external decoration, as before intimated, is of the simplest kind, but yet not devoid of architectural propriety.

The building taken as an example thus contains seventy-five apartments, and is capable of accommodating about 600 inhabitants. The cost of construction, exclusive of land, comes in round figures to 5,920*l.*, which allows of a moderate price for each of the seventy-five apartments. As these vary in size and in convenience, the price will vary accordingly. On the ground floor, a residence of two chambers, anteroom, and kitchen, will cost in round numbers 92*l.*; while the smallest residence, comprising one room and a kitchen, will cost only 52*l.* According to the number, size, and position of the apartments, the prices may be taken to range, on the first floor, from 50*l.* to 82*l.*; on the second, from 49*l.* to 80*l.*; on the third, from 47*l.* to 76*l.*; and on the fourth from 35*l.* to 52*l.*

The arrangement made by the muncipality is to receive payment in fifteen years, with interest at the rate of five per cent. per annum. Thus for the first year one-fifteenth part of the cost has to be paid, with interest on the remainder. In the case of a 50*l.* room the annual cost would thus amount to 5*l.* 15*s.* for the first year, to 5*l.* 10*s.* 6*d.* for the second, and so on, diminishing each year till the end of the term, when the apartment will become the property of the tenant. Thus a payment of less than 8*s.* a month will ensure the possession, at the end of fifteen years, of a freehold tenement, forming a solid, commodious, and healthy abode. The cost of the attic apartments comes to the extremely moderate rate of 23½ centimes, or less than 2*d.*, per day.

It will be observed that no allowance is included for repairs. It would have added to the confidence with which the enterprise may be regarded had a special provision been added for that purpose. But the absolute solidity of the Italian houses, which are built so as to resist any but very serious earthquakes, must be remembered. A very small sum will be sufficient for repair. If a small additional payment were added to cover, not only this item, but the daily cleansing of the stairs and balconies, and the removal of dust and rubbish, the economical nature of the investment would not be seriously interfered with, and more reliance might be placed on its sanitary regulation.

It must be remembered that not only is the cost estimated for a building of magnitude, such as that in question, too low to be taken as applicable in England, but that nothing was paid for land. The addition to the cost of the house of the price of 1,474 square yards of land will be an item of which the magnitude will depend on position. Five-and-twenty or thirty per cent., at least, must be added to the cost for land in a central position, if this has to be purchased.

We should like to see an estimate of a compound residence on the plan so fully illustrated by Signor Bonaccorsi for London, Manchester, or some great English town. We must omit the luxury of a marble staircase; but we should like to see some attention paid, as before described, to the main lines of architectural definition. The sense of self-respect of the tenants would be raised by the mere fact of having their abode in a structure of architectural dignity, however severe in its simplicity, instead of having merely to look at a wall with so many glazed holes in it. A normal estimate, laid down on such lines as we have indicated, might lead to the devotion of a sufficient sum of money to the experiment in unexpected quarters.

THE THEATRE ARCHITECTURALLY CONSIDERED.

A GREAT deal has been said, and is continually being said, as to the need of improved arrangements for convenience and safety in the plan and the access to theatres; not a word too much, since it requires the most persistent repetition of advice and caution on the part of public journals, and threats of penalties from more official quarters, to induce managers to adopt even the most obvious and necessary precautions to guard such buildings from danger by fire, and to render egress from them, if the danger really exhibits itself, possible for a large audience within a reasonable space of time. In fact, the persistency of lessees or managers in ignoring such precautions as far as they can venture to do so is not more remarkable than the easy-going spirit of the public which will see itself brought into needless risk with entire indifference, except just during the period of a panic supervening upon some unexpected conflagration or crush.* One can hardly mention theatres at all without giving one more jog to this subject in regard to London theatres, especially as the only chance of getting attention paid to it at all seems to lie in never letting it rest. But there are some other points in regard to theatre-building which, though not in one sense so absolutely and practically important as safety of construction and facility of egress, cannot but suggest themselves in regarding the theatre from the point of view of an architect, and to which it is worth while to call attention every now and then, though all the immediate effect that we can hope to produce by our reflections is, perhaps, to suggest to an influential reader here and there a wholesome discontent with things as they are, and an ambition to have them improved, such as may gradually spread itself and mature into a public taste which will exercise its influence on future structures, or on the rebuilding or redecorating of the old ones.

Considering how numerous theatres are in London, and how important a part they play in the public life of the day in most large towns, it is really remarkable how little they contribute to the architectural adornment of our streets and public places. In a large proportion of cases in London, the theatre, so far as externals go, is simply a large entrance-door, with more or less gew-gaw decoration about it, and enlivened at night by various tawdry devices of illumination inferior in taste and design to what a tailor or purveyor "to the Royal Family" will put up over his shop on a gala night. The reason for the retiring nature of theatrical property in regard to its frontages is, of course, obvious. Being almost always to be used by artificial light, or (in exceptional cases of daylight use) being a class of building which can easily be lighted from the roof, it is a natural result of economical giving and taking that the expense of new frontages should be spared, and that the theatre should in a large number of instances be entirely regarded as an interior, got in, as may be most conveniently and inexpensively managed, amid existing house property, which can be left untouched, and in most cases undepreciated, or even raised in value, by the proximity of the place of amusement. Where this can be done, it would, of course, be out of the question to expect that money should be expended on an effective exterior, unless those who supplied the capital saw very clearly that the expenditure on appearance would eventually tend to repay itself by its attractiveness; and in most cases, perhaps, it would be chimerical to expect this. Even, however, when nothing can be seen of the theatre but its entrance to the stalls in one street, and the pit entrance up a side street, which the *gamin* is so eager to point out to every one who can be supposed to be looking for it, there is surely room for some improvement on the merely gin-palace style of lighting up and decorating which distinguishes almost all these entries, and gives on the very threshold the first impression of tawdriness and false glitter which runs through the whole idea of our theatrical decoration. And the odd thing is, that this catchpenny style of painting and illuminating is applied just where one would think it was least wanted,—at the entries leading to the best seats, the filling of which depends on the public repute of the performance as gathered from report and from press criticism, and not upon any momentary enticement of the idle and unwary. There might seem more reason in applying this kind of gaudy show to the pit and gallery entrances, since the audience which enters here does partly consist of those who may be attracted to enter without having previously intended to do so, which can scarcely be the case with that part of the house for which the seats may be secured a month in advance.

However, this is a minor and not strictly an architectural point, except that one may wonder why the entrance to a place of entertainment, which is supposed to be for the best class of society, should be decorated in no better and less vulgar manner than is in vogue for a public-house. But in the more exceptional instances in which a theatre is built standing free, or partly so, and is externally as well as internally a new and separate building, the common-place character of the architecture, and the want of coherence between the nature of the building and its architectural treatment, is in almost every instance conspicuous; and seems the more so because the building is one which gives so much suggestion for original and emphatic treatment. The contrast between the requirements of the auditorium and the stage, the necessity for spacious lobbies and staircases to the former part of the building in any house on a large scale, the curved line almost invariably given to the auditorium, are all so many suggestions (which one would suppose could hardly be ignored) for a special treatment of the building, so that there could be no doubt for what purpose it was intended. There is hardly any precedent in modern architecture, it must be admitted, for doing this. The large theatre in London which has longest escaped the fate of theatres, and has lasted since its famous conflagration *Consule Planco* to the present day, is simply a cubical block with a cement front, which might be a riding-school, a Dissenters' meeting-house, or anything else. The only thing that can be said for Drury Lane externally is, that at any rate it is not tawdry, and so far escapes one source of vulgarity. Its sister house has been rebuilt in recent days, with much cost and considerable ingenuity of construction; but it may be said that the same drawback, want of definite character, is even more conspicuous it its case, because it is not absolutely destitute of architectural pretension, but has a front with a certain stateliness. The general design, however, is only the Drury Lane cubical box, with some architectural dressings. Of the once projected opera-house on the Embankment, much need not be said; there was more intention of distinguishing between the two portions of the building in the design, in a manner borrowed from the Paris Opera-house; how it would have looked in execution, one can only guess. What is obvious, however, is, that the detail and style would have been very common-place and very much beneath the demands and capabilities of its splendid site.

The short-coming of large modern theatres architecturally seems to consist, first, in the absence of any attempt to utilise the real forms of the plan, and the requirements of the different portions of the building, as the basis of the general grouping of the design; and, secondly, in the employment of a conventionally florid and even tawdry decoration, which seems to be accepted as the right thing for a theatre, which is, in fact, so decidedly accepted, that when we do meet with the same class of decoration in other positions we stigmatise it as "theatrical," and in so speaking convey the most marked condemnation of the taste of the designer. Taking the latter portion of the iniquity first, it is surely time that we should endeavour to impart a better class of design, a purer and more refined architectural treatment, to such a building as a theatre. Unless we except a church, there is no kind of building in which the æsthetic part of architecture may rightly be so prominent, in comparison with the practical, as a theatre. It is essentially a building for artistic purposes, often for the combination, one may say, of two or three arts. Yet in general it may certainly be said that there is hardly any class of building in which architectural refinement of style and detail is less considered. When money is expended on architectural embellishment, the great object seems to be to make the theatre as showy as possible. The famous building at Paris is the culmination of this meretricious taste, indulged under peculiar advantages for carrying it to its utmost extent, and carried out with the admixture of much sculpture and other detail which is really brilliant and fine in an artistic point of view, but still, with a total effect which is undeniably, from the highest artistic or architectural standpoint, vicious and vulgar. The influence which probably leads to this proverbially theatrical style may be considered when we come to speak of the interior of the theatre, which, we need hardly say, is in this respect generally even more marked in character than the exterior. The other fault which is to be found in the external treatment of the theatre generally is the want of a breadth and simplicity of architectural treatment, expressing frankly and characteristically the real constructive ordinance of the building. The auditorium is always, according to present ideas as to seating an audience for seeing and hearing, arranged on a curvilinear plan, which is almost invariably ignored in the architectural design, although a curved bounding line, on a large scale, is so universally effective in architecture, that it has not unfrequently been invented for the sake of effect when there was no practical call for it. But the modern theatre-architect almost invariably conceals this true source of architectural effect behind a facing or façade of square design, which may just as well belong to a concert-room, a ball-room, or any other place for large public gatherings. The stage portion is almost necessarily a square block of buildings, and by absolute requirement it must rise pretty high above the auditorium ceiling, so as to allow space for the vertical hoisting of scenery. There is a real suggestion here for an unusual and powerful architectural contrast; but, instead of working this out into something striking, the theatre-architect, in almost every case we can call to mind, contents himself with a big, ugly pile of roof, and hoping that no one will notice it much. It is certain the thing may be very much better done than this, and that an opportunity has been presented by the modern theatre which the modern architect has generally failed to make the most of.

When we come to the interior of the house, everybody must admit that the case for the prosecution is even stronger than in regard to the exterior. It may be true that theatre decoration has advanced with the advance in taste of late years, but relatively it is in much the same position as it has been for long past. What would be vulgar and showy in a private house is the best that can be got in a theatre. When we hear that the —— theatre has been newly decorated during the recess, we know that we shall find the proscenium a mass of coarse gilding, with commonplace emblems or monograms here and there; and that the ceiling and other places susceptible of decoration will be in keeping, the gilding being mostly laid on a quantity of raised pie-crust detail executed in *papier-mâché*. The pie-crust is not quite so rampant as it used to be, but there is still a formidable amount of it to be met with. The object seems to be that every thing should conduce to a general effect of glare and glitter. This would be considered bad taste in a drawing-room in howsoever rich a mansion, and would be hardly likely to be admitted to the same extent in a concert-room: then why in a theatre? As far as we can see, it merely arises from some vague tradition that theatres, as places of recreation and relaxation for the evening, are expected to be gorgeous and brilliant in effect. But the fact is, that the theatre is exactly the place where this ought not be. In the first place, it is emphatically an artistic entertainment, or, at least, should be, and therefore, of all places, should show artistic refinement and taste in its embellishment; and secondly, because to over-decorate the auditorium in this manner is really in antagonism with the object of the interior, which should be to concentrate the chief attention on the stage and its scenery and figures, and not to attract the eye by a profusion of comparatively coarse and *prononcé* decoration close to the spectators and interposed between them and the scene. Such a display of gaudiness is not only in bad taste in itself, but often positively injurious, rendering the scenic effect weaker and less real by contrast, and giving an additionally cold and colourless effect to the costume of modern comedy, when that is the object.* In fact, the usual type of theatre

* Only a few days since, a complaint appeared in the *Times* that on a particular evening the access to the stalls in the Covent-garden Opera-house was entirely blocked with chairs—contrary to the express orders of the Lord Chamberlain, as we need not observe.

* We remember one instance in which, on reopening a theatre after decoration, it was thought necessary to abandon, almost at the last moment, a comedy of modern life which had been in preparation, and substitute one in

decoration makes an excellent framework for an extravaganza or ballet with brilliant costumes and accompaniments; but it is much in the way of any entertainment in which acting is of more account than costume. The house is meant to look from, not to look at; and the eye should not be attracted by anything too strong or prominent on the spectator's side of the proscenium. The proscenium arch itself is capable of, and offers a natural opportunity for, a great deal of delicate and suggestive treatment in design—it is the frame through which the living picture is seen; but then its character as a frame must be preserved, nor must it be such as to divert the eye from its true object, the scenery and acting on the stage.

In endeavouring to realise a higher class of architectural treatment in the interior of theatres, there is, of course, the difficulty to contend with, that the materials to be used must be such as will be acoustically good, and that the materials most satisfactory in this respect are not those which are calculated to realise the best architectural effect. It may be urged, in fact, that plaster, the very material which has been so grossly misused in the theatre, offers about the best means of combining an incombustible character with acoustic suitability (fibrous plaster, at least, offers this combination). If we accept this, plaster may at least be treated with more reserve and refinement in regard to design than it usually has been in theatres, and be made to appear more obviously what it is, a mere application, instead of mimicking construction or carving. But, in fact, as it is utterly impossible to make a theatre of fire-resisting materials compatibly with acoustic excellence, it does not seem of very much consequence whether a material, more or less inflammable, be employed; the object in regard to this part of the problem must be to keep fire away from the auditorium, and to provide ample egress by fireproof corridors and staircases in case of accident. With this reservation, there seems no reason why wood should not be employed, both as a lining (than which hardly anything could be better for acoustic effect) and as the ground-work for ornamental treatment. Whether this be adopted or not, what is certainly desirable is that gew-gaw finery, in whatever material, should be turned out, and that it should be recognised that an unobtrusive, quiet, and tasteful system of decoration is as desirable in a theatre as in a drawing-room, and may just as well be realised there, when once people are got out of the habit of expecting to find their theatrical entertainments placed in a setting of gilt gingerbread. A similar criticism may apply to that unsatisfactory and often ludicrous affair, the act-drop; sometimes a "gorjus" curtain, with painted folds and festoons, such as we know it never could naturally fall into; sometimes an improbable landscape, with impossible figures, the absurdity of which strikes one the more forcibly after seeing the same curtain, as one frequently does, for many seasons. We recall one which used to provoke the satirical spirit within us, where a man is continually whirling round in the air a damsel whom he has lifted from her feet in the excitement of a dance; another with a mermaid continually and perseveringly swimming across an open piece of water, with wonderful rocks in the distance; our readers can most of them add to the list without difficulty. If instead of these trashy productions, a drop-curtain were treated as a field for good decorative design, with perhaps figures blended with the design, it might be made the opportunity for the display of some artistic work of a really high class, and in the most suitable manner.

The shape of the auditorium is usually regarded as a matter pretty well fixed in regard to general principle and arrangement, and only differing in detail. It might, however, be worth while to consider whether the usual horseshoe form is necessarily the best for every case. In Wagner's Theatre, at Bayreuth, as we recorded at the time of its construction, a wide stage and a correspondingly wide auditorium were used, the audience sitting facing the stage in parallel rows. This is, perhaps, an arrangement only suitable when a large and wide stage is required by the nature of the performance; but the plan, or some modification of it, has its recommendations. It does not compel the spectators at the extreme points to look so far into the wings and thereby lose the illusion; nor does it (as carried out at least in the Bayreuth Theatre) compel a large number of them to sit under the ceiling of a gallery or upper story and have the annoyance of columns before them. These thin iron columns in any case are a great element in the destruction of architectural effect and expression, and it would be a great gain if, when it is necessary to seat an audience partially in stages one over another, these could be contrived on the cantilever principle, and the columns dispensed with. The attainment of a monumental simplicity in design and decoration, with the greatest convenience and satisfactory acoustic result, is the problem yet to be solved in the modern theatre.

After all, as in most matters connected with architectural style, the architectural defects of the modern theatre are the reflection of other more deep-seated defects in the theatrical and social system. The theatre at present is so much a matter of individual speculation on the one hand, and of ephemeral taste or fashion on the other,—it is so devoid of national character and of serious aims, either artistic or moral, that it is not suprising that the building should partake of the same ephemeral and superficial character. To this may be added the conviction (not unreasonable) that it is the lot of every theatre to be burned after no very long period of existence, as another motive which may stand in the way of the expenditure of capital on a building of nobler style and enduring construction. In fact, however, this objection is one which answers itself, since the building of theatres with more care and of more enduring materials and construction, would tend to lessen, the danger from fire, and prove in the long run the best economy. But the motive which would most surely operate in evolving a more noble and dignified theatrical architecture would be the raising of the drama to the *status* of dignity and importance, as an object of national interest, which it still partly occupies in France, and which it once occupied, in fact, though not quite so ostensibly in theory, in this country. We held a far higher position in this respect when the present Drury Lane was built than we do now; and, to some extent, the building itself indicates this. Plain and almost grim as it is externally, it was intended at the time as a worthy and permanent home of English drama (not of Italian opera) and the spacious and, according to the architectural lights of that day, stately character of the staircase* and entrance lobbies sufficiently indicates this. Its erection was a matter of public interest, as is evident from the literature of the day, far more than the erection of a new theatre would be at present; far more than was excited by the rebuilding of Covent Garden, the nearest parallel case to the present day. There is, at present, no motive for the erection of a fine class of buildings for the drama, because it has ceased to be, either in theory or fact, a matter of national interest or of the expression of national character. If we could revive the drama in England from a system of *rifaccimenti* of unhealthy compositions "adapted from the French," to be once more a noble, national, and intellectual recreation, our theatres would probably ere long shed their tawdriness and adopt a garb more worthy of the occasion, and our new buildings of the same class would realise the dignified and permanent architectural character which would then be in accordance with the object for which they were erected.

St. Luke's Artisans' Dwellings Scheme Last week, at the invitation of Mr. W. Hurran, guardian, a meeting of ratepayers was held at 250, Whitecross-street, to take into consideration the advisability of adopting measures to provide accommodation for those persons compelled to remove by the wholesale pulling down of houses now going on in various parts of London by the Metropolitan Board of Works and railway companies. It was argued that the ratepayers suffered considerably by the change, in consequence of the land lying so long vacant, and that trade was driven from the district. It was resolved that an association be formed to meet the exigencies of the case, to be called "The St. Luke's Artisans' Dwellings Scheme Association," to facilitate the building of dwellings for the labouring classes, thereby lessening the rates, and retaining trade.

which brilliant costumes could be introduced, to prevent the actors being "killed" by the new decorations. This was certainly placing the accidental before the essential.

* It is obvious from its illustration in engravings of the day that the main staircase was then considered an achievement of some importance in architectural design. In the present day, a staircase of the same relative importance and pretension would be much more probably attached to a railway hotel than to a theatre.

IS THE THROWING OF THE CRUDE SEWAGE OF LONDON INTO THE THAMES A NUISANCE?—IS IT PREVENTIBLE?

Observations made in our pages recently under the heading, "Is the Health of East London Worth Attention?" have excited, as might have been expected, considerable interest in some quarters. In the course of those remarks,* we cited, from the accordant enactments of more than half a dozen Acts of Parliament, distinct proof that it had at no time been the intention of the Legislature either to allow any part of London to be exposed to the pollution of the waters of the Thames within its limits, or to allow the Thames itself to be a permanent exception to the law regulating pollution of rivers. To many persons, indeed, it may appear to be a work of supererogation to attempt to make more plain such self-evident truths. But it becomes necessary to assert them, in consequence of the contradiction, both practical and formal, to which they are exposed by the operations and by the publications of the Metropolitan Board of Works. "There is no evidence whatever," reports Sir J. Bazalgette to his Board on the 15th of April, 1878,—"which suggests the statement that the sewage works its way up the river, and that statement is contrary to the fact." It is remarkable to contrast this statement with one produced by the same engineer to the Institution of Civil Engineers on March 14th, 1865, which was as follows:—"The wind and other causes would vary the result, but it may be roughly assumed that a substance in suspension works up the river about one mile a day at each high water as the tides strengthen, and down the river two miles a day as they fall off." In the same report the author claimed credit for the fact that "the sewage is delivered into reservoirs situate on the banks of the Thames, and placed at such a level as will enable them to discharge into the river at about the time of high water. By this arrangement, the sewage is not only at once diluted by the large volume of the Thames at high water, but is carried by the ebb tide to a point in the river twenty-six miles below London Bridge, and its return by the following flood tide, within the metropolitan area, is effectually prevented."

The first outcome of this statement is,—that the Metropolitan area is to be held to terminate seven miles west of Barking Creek, or half a mile west of Greenwich. To that point, according to the authority cited, matter put in suspension at Barking at high water neap tide will ascend by high water at the following spring. That is the evidence on which the whole project of getting rid of the sewage is based. At certain springs, indeed (as was the case in July, 1851), the working up the river occurs not only for seven miles, but for nine miles. Of the two experiments relied on, one gave the higher, and one the lower figure. Eight miles will be, therefore, a mean, and nine miles will be within the limit of occasional occurrence.

But this view of the case omits a very essential element. The Thames at Barking is 7-16ths of a mile wide. Soundings give a depth, in the middle of the channel, varying from 15 ft. to 19 ft. At a rough estimate the low-water volume at that spot will be about 2,500 metric tons per foot run of the river, while the tidal flow will more than double that volume, raising it at high water to 7,000 metric tons per foot. In 1834 Rennie estimated the flow of water over Teddington weir at 1,337 cubic feet per second. Thus, for 55,660 cubic feet of water, or 2,500 metric tons, to pass the weir would occupy forty-nine seconds. The mean velocity of the river was taken by the same engineer at two miles per hour, or 176 ft. per minute, which is rather less than 3 ft. per second. It will appear from these data how slow must be the seaward movement of the bulk of the water of the Thames at Barking. Into this quantity of water, running at such rates of speed, the discharge from the northern outfall is poured for three hours and forty minutes per tide. The pumping power at Abbey Mills was calculated to provide for lifting 15,000 cubic feet per minute, that at Crossness for a mean duty of 10,000 cubic feet per minute. Dividing, in that ratio, the 120,000,000 gallons discharged into the Thames in twenty-four hours, we find that 36,000,000 gallons per tide, or 163,636 gallons per minute, is poured in for 220 minutes each tide. This gives a dilution, as compared to the steady outflow of the river, of

* See p. 741, *ante*.

not quite four equivalents of water to one of sewage, the river outflow for the minute being 500,582 gallons, and the sewage outflow for the same time being 163,636 gallons. We have seen that the quantity of tidal water is to that of the river in the reach about as thirty-five to twenty-five. Regarded as a bulk of water, the volume contained in the reach at any moment presents a large proportion to the influx of sewage. But we must regard the rate of movement of the water as compared with that of the influx of the sewage, as well as their respective bulks. We have, then, to bear in mind the fact of the travelling backwards and forwards, as shown by Sir J. Bazalgette, of the water contained in any section of the Thames. During a half-lunar period there will be a given influx of tide, and an equal efflux. This will remove, tide by tide, a certain quantity of sewage, that quantity entirely depending on the degree of admixture between the sewage stream and the general volume of the water, both fresh and tidal. But during the time that the springs are making, all that can be reckoned on as carrying sewage out of the reach of regurgitation is the flow of the river itself. And it will not be the flow for twelve hours, but the flow for three hours and forty minutes, per tide, that has to be regarded as in the first place to be mingled with 163,636 gallons of sewage per minute at Barking, and, twenty-five minutes later, to be mingled with a further quantity of 123,077 gallons per minute at Crossness; making a total of 286,713 gallons of sewage to every 500,582 gallons of fresh river water.

As these figures give a result widely different from that indicated by the Metropolitan Board of Works, it will be well to verify them. The daily outflow of the Thames, according to Rennie, is 3,223,125 tons of water. Of this the quantity flowing out in the seven hours and twenty minutes of the escape of the sewage will be 992,799 tons. Into this volume, during the time of its overflow, are poured 545,545 tons of the effluent matter from the London sewers at the two points of discharge. A mixture of less than two parts of water to one of sewage is the result. This mixture undergoes two further steps of dilution,—one due to the fact that the volume of water at Barking is so much in excess of the volume where the Thames was gauged (a dilution which, however, is to a great extent counteracted by the slower movement of the current where the cross section of the river is larger), and the second due to the incoming tide, which in volume is more than double the volume of the river, but which is subject to an alternating movement up and down the channel of the stream.

The only point which remains undetermined (within the limits, as mentioned by Sir J. Bazalgette, of variation of wind and tides), is the distance travelled by the sewage during the three hours and forty minutes for which it enters the river at Barking. As to this we shall guide ourselves, as hitherto, by the statements made by Sir J. Bazalgette in 1865. He said then,—"As regards the time of discharge, it is demonstrated by the same series of experiments that the delivery of the sewage at high water into the river at any point is equivalent to its discharge at low water at a point twelve miles lower down the river. The mean time of the fall of tide may be taken to occupy seven hours twenty minutes. If a distance of twelve miles is passed in that time, half that distance will be made in the three hours and forty minutes of the sewage escape. Thus, to the eight or nine miles above Barking to which, according to Sir J. Bazalgette's data, the sewage thrown into the Thames will work back from neaps to springs, must be added six miles of daily regurgitation, due to the period for which the sewage so flows after high water. This gives a point fourteen or fifteen miles above Barking inlet, or from 3½ to 4½ miles above London Bridge, to which, on a full spring tide, the polluted water will, with as much certitude as is due to the observations of the data on which these very simple calculations are based, inevitably ascend.

We are anxious that the matter should be fully understood; and that the more so, because, as has before been remarked in our columns, the Metropolitan Board of Works has chosen to take the tone of being within its Parliamentary rights, and of being thus in a position to defy not only the Thames Conservancy Board, but all the world. Our argument is twofold. First, we have to contend that the Parliamentary rights, if any such exist, of the Metropolitan Board to pollute the Thames are not absolute, but conditional and temporary. As to that, we really think that, after the facts we have before cited, there can be but one candid opinion. Still, as the Board seem disposed to despise opinion, and to lean on the exact letter of the existing law, denying, even to Parliament, the right to explain its own intentions, it is essential to look at the matter in the light of the pound of flesh. As to this, we contend that the Board has not done that which it was appointed to do. It has made an oversight; a rather curious oversight. It has omitted to make any allowance for the time which it must take to run 120,000,000 gallons of sewage out of its reservoirs, though it performs this conservative function without being in any way impeded by the application of any process for the previous disinfection of the effluent water. "We are authorised," the Board may be thought to say, "by our Amendment Act of 1858, to carry on and complete according to such plan as may to us seem proper, the necessary sewers and works for the improvement of the main drainage of the metropolis. We have done so. We were authorised by our first Act, to sell our sewage; but no purchaser is in the market. We were not bound to disinfect it, and we have no intention of doing anything of the kind. We are not a board of health. We do not care for health or for doctors. We had a great work to do. We have done it. We deserve public gratitude. And we ask Parliament to show its appreciation of our high capacity for administration by making over to us the power of the water companies and of the City Bridge Committee, and by allowing us to set the conservators of the Thames at defiance." That is, in fact, if not in literal expression, the contention of the Metropolitan Board of Works. Therefore, it is needful for us to take up the second point of contention, and to show that the Metropolitan Board is not within the protective limits of its Acts of Parliament.

By the Metropolis Management Act of 1855 (18 & 19 Victoria, cap. 120), the powers and rights vested in the Metropolitan Board of Works are stated to be given "for preventing all or any part of the sewage within the metropolis from flowing or passing into the river Thames in or near the metropolis." Further, "they may cause the sewage or refuse from the sewers to be sold or disposed of as they may see fit; but not so as to create a nuisance." And the amended Act also is stated to be for the purpose of preventing, as far as may be practicable, the sewage of the metropolis from passing into the river Thames within the metropolis.

But on certain days in every month,—according to the data furnished by the engineer of the Metropolitan Board,—a considerable portion of the sewage of the metropolis does, by the action of the Board, pass into the river Thames within the metropolis. Measures have not been taken for preventing this as far as may be practicable. The sewage is disposed of so as to create a nuisance. As to that, the law, as cited by Mr. Higgs (Treatise on the Law relating to the Pollution and Obstruction of Water Courses, p. 119), is clear and unmistakable:—

"Nuisances to water may be either of a public or a private nature. A public nuisance is an injury to the property of all persons who come within its influence, while a private nuisance is an injury to the property of an individual. Nuisances to water may be restrained by injunction. If the nuisance be public, by information at the suit of the Attorney General; if private, at the suit of the persons suffering special injury. The fouling of a public river so as to render it unfit for the use of man is also an indictable offence."

That the turning of raw sewage into a river is a legal nuisance there can thus be no doubt. The cases in which this has been decided are conclusive. And further, "It is no answer to an information for the purpose of restraining the pollution of the river by the sewage of a town that the river was foul before receiving the sewage, or that it would remain so if such pollution were to cease, for two reasons: 1. The addition of the sewage aggravates the evil. 2. The former nuisance might terminate, and it is not right that when one nuisance terminates there should be another brought into existence (Att.-Gen. *v.* Leeds Corporation).

"The creation of a public nuisance cannot be justified by the provisions of an Act of Parliament." "Thus, the authority over sewers, and the drainage powers given by Parliament to local boards, do not authorise the committal of a nuisance by the Boards in the exercise of such power." "The right of drainage into the sea and public rivers (conferred by the Towns Improvement Clauses Act, 1847), is subject to the condition that no nuisance be created." The dictum of the Master of the Rolls deserves to be made known, not only with regard to the Thames, but whenever a river is in danger of pollution.

Referring to the Local Government Amendment Act, which enables local boards to execute works without their district, subject to a proviso which must be taken as explanatory of what a nuisance on water is, Sir G. Jessel said,—"I think the meaning is pretty plain, and it means this. You shall not send your sewage-water into a natural stream until you have made it wholesome water,—until you have got rid of all the noxious matter in it. The next point is, which water is it that is not to be affected or deteriorated? You are not to affect or deteriorate the water in the river—what portion of the water? I cannot accede to the argument of the defendants that it merely means you must not poison the whole river; for a river may be hundreds of miles long. I think it must mean that you are not to affect or deteriorate the water in the river at the point where the outfall is, and that if you at that point pollute the water, you shall not enjoy the privilege given you by this Act of Parliament of making an outfall outside your district." In the same way Vice-Chancellor Wood held that the Council of the Borough of Birmingham, although bound by a local Act of Parliament incorporating the Towns Improvement Clauses Act, were not justified in so carrying on their operations for this purpose as to drive away fish, and prevent cattle from drinking the water of a river at a part even miles below the town, where it belonged to the plaintiff.

We have thus plainly stated the case. The Metropolitan Board of Works could not, according to legal ruling, be authorised by any Act of Parliament to pollute the Thames. But in the Acts on which they rely, they are specially prohibited from so executing their works as to cause nuisance, or to allow sewage to pass into the river within the metropolis. That they do the latter we have shown on the evidence of their own engineer. That they do the former we have shown on the authority of the Master of the Rolls, and of Vice-Chancellor Wood. The only possible reply that we can anticipate is, that such *lâches* and acquiescence has been shown as to enable them to defy all comers. As to that it is observed, "The mere fact of a person bearing for a certain time an evil would not alone prevent the Court from saying that the evil may be arrested, and this still more where the evil is a continually increasing one. Therefore, when sewers constructed under Parliamentary powers had been completed, at a cost of 207,355*l.*, and had been in operation sixteen years before proceedings were undertaken, the court will interfere."

It seems, therefore, to us, that in their communication to the Metropolitan Board of Works of the report of Capt. Calver, under date of October 15th, 1877, the Conservators of the Thames have been, to a certain extent, in error. They have acted as if the rights and duties of an important public body would be so far acknowledged by another public body that measures of public welfare could be discussed between the two. If any such expectation was entertained, it must have been rudely dissipated by the publication of Sir. J. Bazalgette's report. That document, so far from acknowledging that the prevention of the pollution of the Thames is a statutory duty imposed on the conservators, and that the representation of that highly respectable authority are entitled, at all events, to respectful attention, actually proceeds to school, rebuke, and attack the conservators for the discharge of their own functions. Not only does Sir J. Bazalgette assert that there is no documentary evidence,—the adjective deserves note,—to prove that foul and offensive accretions have recently formed within the channel of the Thames, but he goes on to remark that "the unprotected state of the banks, which in many places are being rapidly washed away," "are,"—we are not responsible for the grammar,—"the result of a neglect of the duty which legislation has cast upon the Thames Conservators." It is to be hoped that the Lord Mayor, the two aldermen, the four common councillors, the deputy master of the Trinity House, and the other members of the Thames Conservancy Board, may be edified by this lecture on their duties!

Thus the Board of Works has thrown down

the gauntlet. Being asked to consider certain statements, it begins by denying their accuracy, and concludes by throwing a stigma upon the party making the representation. We shall not anticipate the reply which may be given to the counter-charge, because it is a matter with which the Metropolitan Board of Works have no concern whatever, supposing it to be true. We will only note, for the benefit of those whom it may concern, that there exists a very accurate survey of the Thames, made in the year 1832 by Admiral Bullock, R.N., and that we can say from personal inspection that the details of this chart are such as very seriously to invalidate the data relied on by the Metropolitan Engineer as to that waste of the banks of the river with which, as before said, his Board has no concern.

But the Board of Works goes further. First, it says (in spite of the neglect of the Conservators) the channel of the Thames is improving. For this, the inference is, we are to be thankful to the drainage outfall. Then it is "contrary to the fact," to state that the sewage works its way up the river. The reason for carrying the main outfall eleven miles down was stated, in 1865, by the Engineer, to be the fact that the sewage worked its way nine miles up. We have here not only contradiction, but self-contradiction. In fact, the report simply says "Do your worst."

What that worst may be, the Board of Works do not seem to have counted. We recommend them to make inquiry at Birmingham, at Leeds, at Cockermouth, and at other places where local bodies, relying on local Acts of Parliament, have poured sewage into rivers. We recommend them to read their own Acts of Parliament, which bind them to dispose of the sewage so as not to create a nuisance, and so as not to pass into the Thames within the metropolis. We recommend them to read Sir Joseph Bazalgette's report as to the movement of the river, and the ascent of the sewage-laden water. We recommend them to turn to any recent Act of Parliament, or recently reported case as to pollution, in order to understand what a nuisance on water is. When they have done this, they will, perhaps, come to the conclusion that they have reckoned without their host.

On the other hand, we can hardly imagine any sound reason which should prevent the conservators of the Thames from taking the summary mode of proceeding which has been, we believe, invariably successful in similar cases,—when properly advised. It is no question of a few feet of mud here and there,—of the analysis of the water in one place, and of the mud in another. The daily discharge of the sewage of some four millions of people into the Thames at two points, without any attempt to take the best practical means of defecating it, is a fact impossible to deny, and, at all events, easy to prove. The Conservators of the Thames have no need to attempt to trace the course of the foul stream after its entrance into the channel. The one fact constitutes their case. The fact is not only uncontroverted, but unexcused by the Metropolitan Acts of Parliament. It was not an anticipated procedure,—it is true,—but still the Acts have been made tight enough not to be vitiated by the insertion of provisions tending to justify a nuisance. "The drainage powers given by Parliament to Local Boards do not justify the committal of a nuisance by the Board in the exercise of such powers" (Attorney-General *v.* Proprietors of Bradford Canal). The whole case lies in this nutshell. It is a hard one for the teeth of those who claim a statutory right to destroy our noblest waterway. It is one which the metropolis and the country will expect to see made matter of information at the suit of the Attorney-General on the motion of the Conservancy of the Thames. And as it is the fashion nowadays to sneer at applications for legal or equitable redress, we conclude with one more quotation,—"On proof of a wilful contempt of an injunction to abate a nuisance, a writ of sequestration will be issued."

We hope, then, that those of our readers who have given attention to this and our previous articles on the subject will come with us to the following conclusions.

The health of the riparian inhabitants of London, and especially of East London, deserves consideration. The pouring into the Thames, during two periods of three hours and forty minutes each in the twenty-four hours, of 120 millions of gallons of crude sewage, is not only a technical legal nuisance, but a serious sanitary danger. Its continuance is not authorised by the Metropolitan Act, and is in entire opposition to all legislation, and to all judicial decisions, for the last quarter of a century. It is a nuisance which it is the statutory duty of the Conservators of the Thames to take measures to abate. It is one as to which the law is on their side, and for which the tribunals will grant redress. We, therefore, hold that it should only be a question of time how long it is to be allowed to continue.

IN THE ENGLISH SECTION OF THE PARIS EXHIBITION.

In describing the various pavilions, annexe buildings, cottages, &c., of the Champs de Mars and Trocadéro Gardens, we have found so little to say about England, that we may be excused if, in turning our attention to the main exhibition building, we begin with the English section. Fortunately its whereabouts need not be described. After the exhibits of France, which occupy the whole half of the building, the English section is undoubtedly the greatest attraction, and the greatest success. It is not only the largest foreign section, but it is that which bears the most distinct marks of progress when compared to what has been done at previous exhibitions. Our glass, our pottery and hardware, have elicited the reluctant praise of our rivals; our paintings in the fine-art galleries have won two gold medals out of the four medals accorded to foreign artists, and our furniture, though certainly not equal to that of France for its artistic excellence, gives good promise. All these steps in the road of national progress are very emphatically demonstrated at the Paris Exhibition, and it was not without a certain sense of pride and satisfaction that we visited the section devoted to the arts and industries of England. But, to turn from these considerations of general interest, we quitted the more attractive galleries to examine the classes devoted to matters of technical importance, and at once found ourselves confronting the stand of the now well-known Silicate Paint Company. Here the jury were gathered in force, and were enduring patiently a powerful exposition of the incalculable benefits to be derived from Griffiths's Zinc White. It is true we had no business to listen to this important discussion, so at once plead guilty of journalistic indiscretion. This preparation is not yet perhaps as well known as the silicate paints; and has, in any case, a very practical bearing on the health of both those who build our houses and those who live in them. It has for basis the white sulphide of zinc; but this is so combined with other ingredients that it acquires greater covering power than lead paint, though possessing none of the poisonous qualities of the latter. All who have read Mr. Redgrave's report on the inspection of factories, and have studied statistics of illness and deaths among workmen, will at once appreciate the great benefits to be derived from the use of a paint free from lead; and, as on the French side of the channel, the statistics of the Paris hospitals show that more than a third,—indeed, nearly half,—of the persons treated for lead poisoning are house-painters, we need no longer insist on the necessity of abandoning the use of lead paints. But will Griffiths's zinc white supply an efficient substitute? That is what the jury and the sanitarians who are coming in shoals to Paris will attempt to decide. For our part, we imagine the verdict will be highly favourable. Already the prefect of police has issued orders, dated but a few weeks back, that henceforth the closets of all lodging-houses in Paris must be painted with zinc colours, it being so clearly proved that lead cannot protect the walls against noxious gases. We watched the application of sulphuretted hydrogen to test the zinc-white, and as this pigment certainly does not contain any lead, it did not of course change its colour. In common with the silicate paints, the zinc-white manufactured by the same firm does not produce any chemical action on metals, and it can resist any degree of heat. All these features are carefully shown at the Exhibition, with specimens that have been exposed to every test. Among other things of this description, there is an iron can which has contained salt and water for more than a year, and yet the silicate paint has effectively protected the metal from the corroding influence of the salt. This is attracting the attention of a great many persons, and the paint is being extensively canvassed as the best means of protecting the iron coating of modern ships from the action of the salt sea-water. Certainly, as compared with the paints shown by other nations, this is one of the novelties, and promises to be one of the most useful inventions exhibited.

Around these paints are the exhibits of some of our leading chemical manufacturers. There stands, for instance, an enormous block of alum, 8 ft. or 10 ft. high,—to cure English sore throats, the French visitors remark in passing! Then there are patent soaps, which wash and disinfect simultaneously, with more or less—particularly less—efficacy than usual; and we have also the now celebrated gold palm-leaf stand of Price's Patent Candle Company. This is a particularly elegant exhibit, and the photographs of stearine crystals give an insight of the science,—the chemical knowledge,—required for the successful manufacture of candles. It is, perhaps, strange in these days, when mineral oils abound, when gas burns in nearly every town, that the manufacture of candles should not only prosper, but actually increase. There must be many more persons than generally imagined who consider candles at once more pleasant and more wholesome. They do not produce, in any case, so much heat for the same volume of light as either mineral oils or gas; and this is no small advantage in these hot evenings. They are also unattended by the disagreeable smell which accompanies the not unfrequent escape of unconsumed gas. On the other hand, in the English, as in the French section, there are several patents which profess to remove all these inconveniences. Tice's Improved Dry Gas Regulator is one in point. The gas is admitted into a chamber, and pressed out of it by weights attached to a flexible diaphragm; thus, as in the French patent we described in our last article, the pressure of the house supply can be regulated precisely according to requirements, and independently of the outside supply. By this means the escape of gas due to its passing too rapidly through the burners is avoided, together with the consequent "bad light, offensive smell, smoky ceilings, and heavy gas bills." Again, for places where there is no gas supply, we have the "Sun" auto-pneumatic gas machine, which is a simple machine, occupying but little space, producing a gas that burns evenly, and does not contain the sulphur compounds so fatal to animal and vegetable life. This firm also exhibit Hearson's patent automatic gas-lamp for illuminating streets at the reputed cost of one farthing per hour. A reservoir is placed over this lamp, and does not, as is usually the case, shade the light. It contains autoline, or benzoline free from oil, and the system can be fitted to an ordinary street-lamp. Such inventions are worthy of note, and it is particularly interesting to watch how closely the French and the English patents follow each other. The difficulty nowadays is not the lighting of a room, building, or street, but the selection of the one out of the rival systems which presents the most advantages, or, perhaps, we should say, occasions the least inconvenience and disappointment.

NEW PANTECHNICON BUILDINGS IN SOUTH LONDON.

On a vacant plot of ground, nearly half an acre in extent, in Station-road, Camberwell, almost immediately opposite the Camberwell New-road Station, a large new building is about to be erected, to be called the South London Pantechnicon, which will be of a similar character to the well-known establishment in Motcombe-street, Belgravia, which, it will be remembered, was burnt down a few years ago. The new building will cover a ground area of about 13,000 superficial feet, and will have a frontage to Station-road of 120 ft. in length, whilst it will extend upwards of 100 ft. in depth. It will be carried to a great height, having several floors and galleries, with a spacious area in the centre, and will contain lifts and other appliances for the storage of every description of property, including furniture, luggage, plate, musical instruments, carriages, pictures, and other valuables. The works in connexion with the building have just been commenced.

Ringstead.—The Wesleyan chapel at Ringstead has been re-opened, after repair and enlargement. The work has been carried out by Messrs. William Smith & Son, of Raunds. The total cost has been 330*l.*

GOVERNMENT LOANS FOR LABOURERS' DWELLINGS IN IRISH URBAN DISTRICTS.

There are several Acts of Parliament which deal with the dwellings of the lower classes in Ireland. There is the statute, 23 Vict., c. 19, which is concerned with country districts, and is connected in practice with the Land Improvements Acts. Then there is the Artisans' Dwellings Improvement Act of 1875, which has apparently been so short a time in existence that its operation in Ireland has been inappreciable, though, considering that it is now three years since it became law, we are surprised to find, from the authority of the report of the committee to investigate the management of the Irish Board of Works, that such is the case. For looking at things in the ordinary way, we should have assumed that the greatest activity shown under it would have been in its earliest years, when there was an ample field for its operation. We cannot help fearing, therefore, that if it has not hitherto been employed in Ireland, it may become altogether a dead letter. Then there is, finally, the Act of 1866 (29 & 30 Vict., c. 24), which is confined to urban districts. This Act, we may briefly recall to our readers' memory, empowers the Commissioners of Public Works to make loans to be repaid within forty years at a rate of interest not less than four per cent. to town councils, railway companies, dock or harbour commissioners, trading or other companies, and owners of land in fee, or for terms not less than eighty unexpired years for purchasing sites, and for erecting or adapting dwellings for the labouring classes. Moreover, the loan is not to exceed one-half the value of the property on which the money is to be expended, but if collateral security be given, the full amount of the estimated outlay may be lent. These are the main provisions and the fundamental aim and object of this statute. The Act has now been in operation for twelve years, and the committee are perfectly justified in saying that since the procedure is neither complicated nor expensive, and the facilities given by it are unquestionably great, and considering also how apparent thoughout Ireland has been the want which this Act was intended to supply, it might have been expected that it would have been considerably acted upon. But when we come to figures, we find that unfortunately such is not the case, for during these twelve years only eighty applications have been made,—that is, rather less than seven every year. But this small application is not to be wondered at, when we come to compare the amount of grants in Ireland with those in England made under a similar Act (the Labouring Classes' Dwelling-houses Act), passed also in the same year. In Ireland, one-half only of the loans applied for were granted; in England, five-sixths of the amount have been granted. The reason for this nonfulfilment of natural expectations can be given in a very few words from the report in question,—"We have no hesitation," say the committee (p. xii.), "in saying that we think the Board did not, until lately, place a sufficiently liberal construction on the Act." The subject is one of such great importance and interest that it will not be out of place to consider some of the facts on which this opinion is based.

It is true, no doubt, that of late, as the committee say, the loans have been more liberally granted; but when once the idea was propagated that the Board of Works were very chary in granting loans for the purposes of labourers' dwellings, there can be no doubt that persons would cease to make what they considered useless applications. For instance, the Board for some time refused to grant money for buildings partly completed, on the ground that such loans were contrary to the spirit of the Act, in the face of the fact that by the eighth section money is to be granted and applied "towards the purchase of land or buildings, and the erection, alteration, and adaptation of buildings to be used as dwellings for the labouring classes." When a loan is required for the purposes of completing a half-finished building, it is clearly needed for the purposes of erection. Thus one Mr. Thomson, of Belfast, applied for a loan for twenty-two buildings, estimated value, 1,560*l.*, fee simple title; amount asked for, 1,000*l.* But all that Mr. Thomson got by this application was an answer from the Board that it was "contrary to the Act to grant loans for houses already built or nearly completed." There was no ground for saying that these structures were not intended as dwellings for artisans; the sole basis for refusal was the fact that they were nearly completed, and this was done, as we have said, in the face of a section of a statute which speaks not only of erection, thereby pointing to new buildings not completed or begun, but of alteration and adaptation, which distinctly point to buildings already erected. There can, therefore, be no cause for surprise that the Act in question has not yet fulfilled the expectations of its promoters when it has been practically nullified and strangled by those who should have been the first to encourage persons to take advantage of its provisions. Moreover, it is not very encouraging for the future success of this or any other work entrusted to the Board, to consider the way in which the Board altered their practice in this respect, for they either adopted the first view without proper consideration, and without taking sound legal advice as to the construction of the Act, or they changed their opinions in the most heedless manner. For this is the explanation of the chairman of the Board:—(921.) "And is the granting of a loan in such a case (*i.e.*, of unfinished buildings) contrary to the Act or the rules?—It is contrary to the spirit of the Act, contrary to its intentions." And then, after some intermediate questions, come the following:—(924.) "Then you have changed your practice, in fact?—Yes, we enlarged our area, so to speak." (925.) "And if those people had made their application a little later, they would have got the advance?—I suppose so." A very comforting remark for the persons who applied before these liberal and proper notions reigned in the Board of Works, but one which is a strong condemnation out of the mouth of their chairman of the Board, so far as regards the execution of this Act. It is none too strong, therefore, to say, as the committee do, that "it must be remembered that the effect of withholding from the public the advantage of a statute cannot be measured by the refusal of this or that application. There has to be taken into consideration the deterrent effect that a refusal here and a refusal there has upon intending applicants, more especially in the case of an Act like this, which was in its infancy, and so required to be construed even more liberally than if it had been in full working order."

But a thought of a somewhat legal character thereupon naturally suggests itself, and it is this,—if in this instance and in others the Board have been found to fail palpably rather in mind than execution, what security is there that, as at present constituted, it can be relied on to perform its duties effectually. The instance we have cited was a clear one of an error of judgment, and no amount of extra assistance can cure this defect, and this view of the Act is curiously in contrast with what may be termed the philanthropic one which suddenly overpowered the judgment of the Board, for they decided to refuse applications for loans when they inferred from their knowledge of the applicant that he was merely induced by the easy terms offered by the Act for borrowing money, to come to the Board of Works for speculative reasons, and not from any motive for benefiting the poorer classes. Such a reason is absolutely grotesque,—the main object of the Act was, of course, to give the poorer classes as good homes as possible, and whether the builder was a philanthropist or a speculator was wholly immaterial. Indeed, the Board might fairly have brought their theory to a *reductio ad absurdum* by inquiring whether the philanthropy was genuine or fictitious. Again, a case occurred in which the loan was refused on the ground that building societies and other private persons were erecting buildings near the same place for labourers, and if the applicant's wish were granted, that he would be in a more favourable pecuniary position than his neighbours. This, as it seems to us, was an equally unsound ground with the last, because if the dwellings were *bond-fide* intended for working men, and if the security was sufficient, the Board should at once have granted the loan. It should have made no difference to them whether other persons were or were not building similar dwellings near at hand, because the main question in regard to the Act is the purpose of the building, and the propriety of the security offered. As the committee justly observes, "the Act was passed with a view to attract capital to a field of enterprise, irrespective of the motives of the applicants. . . . . The business of the Board lay in seeing that the security offered by the borrower was sound, and that the plans gave good promise that the buildings would be suited to the requirements of the poor, with a due regard to their comfort, convenience, and health."

We have said, therefore, enough to show that the Labouring Classes' Dwellings Act has failed from no inherent weakness in itself, but from a want of judgment in the method of its application by the Irish Board of Works. Much harm has, of course, now been done, which it will take some years, at any rate, to repair. And a period of commercial prosperity has also gone by in which the Act was more likely to be utilised than at a time when times are bad and business men have few profits to invest for the benefit of the working classes. But it is much to be hoped that the publicity given to this matter by the investigations of the committee will cause the fact that more liberal opinions now prevail, and will prevail in the future, to become known in Ireland, and that during the next ten years the Act will have a vigorous operation. Nevertheless, as we said before, the manner in which the Board of Works have fulfilled the duties cast upon them by this statute must make us hesitate to be too sanguine as to the judgment and the vigour with which they will fulfil them in the future unless public criticism be vigilant and strong.

MEDALS TO ENGLISH ARCHITECTS.

PARIS INTERNATIONAL EXHIBITION.

The Jury of Class 4, Architectural Drawings and Models, have brought their labours to a close. For *all* works of all nations sent in, thirty-seven medals were allotted; of these nearly half, or eighteen, were agreed to be given to the French exposants, who were twice as numerous as the foreign exhibitors. To the foreign architects the awards are as follows:—

	Medals.	Hon. Mention.	Rappel.
England	7	1	1
Austria	6	2	1
Italy	2	1	—
Holland	1	1	—
Belgium	1	—	—
Switzerland	1	—	—
Hungary	1	1	—
	19	6	2

The "Rappels de Médaille" refer to those who have already received rewards or medals in former Expositions in France, as in 1867. This was the case with Mr. Waterhouse in 1867 for the Manchester town-hall, and he sent his best drawing this time of that building, and in such cases as this a diploma will be given, ranking equal to First Medals.

The English list, unanimously adopted, is as follows:—

1 "Grande Médaille"	Mr. E. M. Barry.
1 First Medal	Mr. G. E. Street.
1 Ditto	Mr. Pearson.
1 Second Medal	Mr. Norman Shaw.
1 Ditto	Mr. T. H. Wyatt.
1 Third Medal	Mr. Horace Jones.
1 Ditto	Mr. J. P. Seddon.
1 Honourable mention	Mr. Jackson.
8	
1 Rappel	Mr. A. Waterhouse.
9 Total.	

A question arose as to members of the jury,—whether they should be competitors for the fine arts section? This was permitted by the regulations; but we need scarcely say that *all* the English members, whether as painters, sculptors, or architects, at once declared they could not act as judges and also be competitors. In the Architectural Section the following took this course at the outset:—

Herr Ferstel	Austria.
Commander Basile	Italy.
C. Barry	England.
De Suers	Holland.

The jury had ten members in addition to the above. There were five Frenchmen and Marietta Bey, Egypt. These did not declare themselves *hors de concours;* but Marietta Bey and M. Lefuel were not exhibitors, so four Frenchmen remained. As a matter of fact, we believe, none of these four received medals; but as we have not yet received the full report, we are not quite certain of this.

Under the presidency of Herr Ferstel, all acted together most harmoniously.

It is obvious that the English exhibitors owe

much to Mr. Charles Barry, who looked very vigorously after their interests and position, and succeeded in getting for them the highest number of medals that any foreign nation receives.

TRAMWAY INVESTMENT.

Subscriptions are invited for a first issue of 25,000*l.*, in 5*l.* shares, by a company styling itself "The Tramways Corporations, Limited," the total capital of which is to be 250,000*l.* The undertaking has been formed for the purpose of constructing tramways in different places, apparently with a view to sale. We are unacquainted with the status of this corporation, but commend to public attention, subject to a careful verification of the competence and reliability of the projectors of any new undertakings, any effort to employ English money in improving English ground. We observe, in reference to this project, and also recalling attention to our own remarks (pp. 633 and 681, *ante*) on Roadways, Railways, and Waterways, and on Mr. D. K. Clark's little volume on Tramways, that the Edinburgh Tramway Company, in the report for the last half-year, propose to pay a dividend at the rate of 8½ per cent., and the Hull Tramway Company a dividend at the rate of 9 per cent. per annum.

On the Edinburgh tramways the half-year's revenue is 32,917*l.*, and the expenditure, 25,578*l.* The capital expenditure on this line of tramway, to the close of 1876, was 220,762*l.* for 13·29 miles, or 16,600*l.* per mile; of which the way and equipments amounted to 10,256*l.* per mile. A net income of 830*l.* per mile is thus required to pay 5 per cent. on the capital. The receipts in 1876 were 62,111*l.*, or 4,673*l.* per mile, out of which the expenditure comes to 72·52 per cent. For the last half-year the working expenditure appears to have mounted to 77·7 per cent. of the income. It is to this gradual swelling of the per-centage of working expenses that the attention of shareholders and intending shareholders ought especially to be directed. 16,000*l.* per mile is a respectable capital outlay, and it is only by very careful economy that dividends can be maintained when the rate of expenditure absorbs more than half the gross revenue. In Edinburgh the cost of working is augmented by the steepness of the gradients. This is a matter of the utmost importance on any way worked by animal power. The actual cost of gradient may be matter of calculation, as far as foot-pounds or any units of force are concerned; but when muscles and lungs are in question, the condition and maintenance of the stock have to be taken into account. The number of miles run per horse in Edinburgh is low; it amounts to only 5·80 miles per day of 313 days in the year. The gradients of Leith-walk average 1 in 32, and the maximum gradient is 1 in 14. To surmount this latter pitch a force of 160 lb. per ton, plus the running friction, must be exerted. The saving of friction on a good railway, as compared to an ordinary road, is about 40 lb. per ton, and by the use of oil instead of grease for the axles a further saving can be effected; but at an incline of 1 in 56 the resistance of gravity amounts to 40 lb. per ton, and the commercial value of the saving of running friction diminishes in proportion. If this gradient is exceeded, the economical value of a tramway will be very low, unless the traffic be so great as to insure that only a small comparative amount of dead weight shall be carried. As to the other element of cost in depreciation of stock, namely, the pull required for starting the train, we have already pointed out that the introduction of the principle of the accumulator may be looked forward to as a safeguard. Our readers will see that money is to be made out of tramways, so that they be ably and honestly managed, laid over tolerably level ground, and commanding ample traffic. In the absence of either of these requisites they are best avoided.

University College, London.—Mr. Samuel Sharpe has promised to give 5,000*l.* towards the building of the North Wing of University College, London, so soon as the Council are prepared to begin the work. It is expected that this liberal donation, together with others which have been received, will enable the building to be very shortly commenced. A sum of 50,000*l.* in all will, however, be required to complete the extensions which are immediately contemplated.

AN IMPROVEMENT IN ORGAN MECHANISM.

Messrs. Bishop & Son, the present representatives of the late eminent organ-builder of the same name, have just erected at their factory, in Marylebone-road, a small organ intended to afford a practical illustration of a system of mechanism patented by them, and likely to be of great use in the case of large organs, more especially when it is necessary or desirable that the key-board should be at some distance from the instrument.

The invention consists in a new method of applying wind-pressure to convey the action of the player on the key to the pallet which admits the wind to the pipe. As many of our readers know, the old method of connexion between the key and the pallet was by a direct pull on a long thin slip of wood called a "tracker," with special appliances for taking the pull round angles (on the principle of the bell-crank), so that in the simplest form of the movement there was usually a vertical pull from the end of the key, giving a horizontal pull to the tracker, which in turn gave a vertical pull on the "pull-down" which opened the pallet. When the distance between the key-board and the sound-board was considerable, there was, even in small organs, a considerable *vis inertiæ* to overcome, and the tendency of the tracker to lengthen or shorten under changes of temperature has always been a difficulty, though it may be much decreased by varnishing the mechanism. But when organs began to be so much increased in size as they have been in recent times in this country, the increased scale of the sound-boards and pallets rendered the resistance to the touch of the player a serious matter, and it was to remedy this that the beautiful invention of the pneumatic touch was made by Mr. Willis. The object of the pneumatic lever was not to change the mode of connexion, but to make the wind-pressure do part of the work for the player, by assisting and accelerating the action as soon as the key was partly pressed down. The system patented by Messrs. Bishop consists in making the wind the actual means of communicating the motion of the key to the pallet, in a manner which has the same merit of relieving the player's fingers of the heavy work, and rendering the touch as light and even as that of a piano, and is (within reasonable limits) independent of the distance between the player and the instrument. The first object is equally obtained by the pneumatic lever, which, however, involves rather complicated and delicate mechanism. The present invention is remarkable for its simplicity. Each key communicates with a short "back-fall" and tracker action, on the usual principle, but involving a vertical tracker of only a few inches in length, so that this part of the mechanism (the most subject to derangement) is concentrated close to the keyboard, and easily accessible for adjustment or repair. When the key is struck, the movement opens a valve which admits wind under heavy pressure from a special bellows (and called the "driving-wind") into a pipe of ordinary gas-pipe tubing of small bore, which is carried to the sound-board of the organ, and which terminates in a very small narrow bellows (one for each tube), immediately under the pallet which admits the wind to the pipes corresponding to the key that has been struck. As soon, therefore, as the valve at the key-board end of the pipe is opened by the player pressing the key, the air in the tube is strongly compressed by the pressure of the driving wind, and instantly inflates the small bellows at the other end of the tube. The lower jaw of the little bellows descends, pulling down with it, by a short vertical tracker, the pallet over it, and admitting the wind to the pipes. As long as the key is held down, this position of things is maintained by the pressure of the driving wind; as soon as the key rises, the driving wind is cut off again from the tube, and the pallet is closed in the usual way by a spring, drawing the bellows up again. At the same moment the surplus compressed air in the tube escapes back again through an exhaust-valve at the key-board end; the exhaust having been closed by the action of striking the key, but allowed to open again the moment the key is released. The process sounds complicated in description, but in working it is most simple and instantaneous in its action, and seems very little likely to get out of order when properly made. The action of the draw-stops is conveyed to the slides in the same manner, through tubes of rather larger scale. The system gives great facility for placing the player at a distance from the instrument, without in any way interfering with the rapidity of the action: for so long as the tube is air-tight, the compression instantly operates in a tube of considerable length. In the only large organ to which the system has yet been applied, that at Great Yarmouth Church, the action is conveyed through tubes 50 ft. in length, and the organist is seated among the singers, while the organ (divided into two halves) stands at some distance in the middle of the adjoining broad aisles.

When we say that the driving wind is supplied by a special bellows, it must not be understood that there is another bellows to be worked to furnish the ordinary supply of wind to the pipes. The heavy pressure bellows furnishes the whole wind to the organ; but for the pipes the pressure is diluted, as one may say, through a second bellows into which the wind passes before entering the pipes, the pressure of wind being automatically reduced in passing from one bellows to the other, by a special process, the nature of which the inventors do not wish to make public at present.

There is good precedent for expecting that Messrs. Bishop's invention will be largely adopted and become recognised as a useful one, for the original founder of the factory was the inventor of two of the most useful and almost universally adopted improvements which were made in English organ-building, the "concussion bellows" (for equalising the distribution of wind between the larger and smaller pipes in case of a sudden large demand from the former), and the "composition pedals," for throwing out the stops in groups without compelling the player to withdraw his hand from the keys: the latter being, perhaps, the most important mechanical assistance to the player that has been invented in this country, and which has been for a long time applied to organs so much as a matter of course that its origin and the name of its inventor are forgotten by many. The invention we have described will, we hope, prove equally to the credit of the present representatives of the house, who keep up the repute which the factory of Bishop has always deservedly had for fine tone and first-class materials and workmanship.

FREE LIBRARIES AND THE WORKING CLASSES.

It is by no means creditable to London that provincial towns should avail themselves so much more readily of the Free Libraries Act than the metropolis. The Londoner looks upon the provincial as rather a person to be pitied; but when we contrast the manner in which the inhabitants of provincial towns establish and use free libraries,* patronise tramways, and take the management of the water supply into their own hands, it becomes evident that there is more real energy and public spirit in the provinces than in London. It was but a short time since the inhabitants of Kensington were invited to put the Free Libraries Act into operation in that large and wealthy parish, but alarmed by the bugbear of "more taxation," the proposal was negatived, although it was conclusively shown that by the limitation of rating powers in the Act the amount required would have been very small. That, however, is not the subject upon which we wish to make a few remarks now; what we think should be considered by all who may have to make up their minds on this matter is the value to the working classes of free libraries. And of the term "working classes" we would not confine ourselves to mere manual labourers; for by this expression must be understood,—here at any rate,—workmen, &c., as they are generally called, small artisans, and, indeed, all who do not come within the professional classes, such as lawyers, merchants, and so forth.

It is evident, then, that the value of free libraries is twofold. In the first place, they afford the means of passing leisure hours, when work is done, healthily, pleasantly, or instructively; and in the second, they also afford the means for the working-man to improve himself individually in his work, and consequently can improve the quality of the whole class of work which is performed. But even the first con-

* We give by way of illustration the statistics of the Free Public Library in Birkenhead,—a town the large majority of the inhabitants in which are shipbuilders, operatives, and small tradesmen,—for the week ending July 27 of this year. Reference Library: works issued (novels excluded), 418; average per day, 69. Lending Library: works issued, 1,148; average per day, 191.

sequence may be said indirectly to be of actual professional value to the working-man. If an artisan lives in a 20*l.* rental house, and there is a rate for the free library of 1d. in the pound, he will have to contribute in the course of the year the sum of 1s. 8d. We will assume that he is a man of some intelligence, and buys, from time to time, as many workmen do, an illustrated paper and a cheap book or pamphlet now and again. The free library being in existence, he may, if he please, though we should not advise it, save this money so spent by obtaining the papers and books from the library in addition to many others which hitherto, from their price, he has considered wholly out of his reach. Again we venture to think that workmen, if they can obtain books in the evening, will often spend a quiet evening at home instead of going to the public-house by way of passing the time. We do not say that at the public-house they get drunk. We need not go so far as that. But at the public house it is quite certain that some money will be unnecessarily spent; for it may be laid down as a true proposition that drink without food is, in nine cases out of ten, wholly unnecessary, and often, indeed, positively harmful.

With his book at home, the workman will find himself in the morning not only fitter for his work, but 6d. or 8d. richer than he would have been had he passed the evening in front of the bar of a public house. We do not, let it be understood, wish to see workmen abjure the companionship of their fellows: workmen's clubs, and any meetings of workmen or others from time to time for social or professional purposes, are distinctly good; but what we condemn is what may be seen in any town to such a large extent in these days, what is best described in a somewhat American fashion as "loafing" at public-houses and in tap-rooms. When we consider the value of money to all men who earn their living by their hands or in daily work, and also the value of health, it is quite obvious that if free libraries become in time largely established and largely used, the workmen will benefit both in their pockets and in their bodies. We have said nothing about the obvious benefits which a man receives from wholesome and pleasant amusement, such as reading undoubtedly is,—indeed, it is too plain to require us to point it out more fully here.

But when we come to the second point, it is evident that the proper use of free libraries should benefit the workman directly in his professional career. At the present moment the workman has no means of consulting and reading works which bear directly or indirectly upon his own trade. Except by means of the fragmentary information to be gleaned from a penny paper, he has scarcely any opportunity of becoming acquainted with the way in which his trade is being carried on in a foreign country. Certain class papers, such as the *Industrial Review*,—we say nothing of our own,—deal with this kind of matters; but, on the other hand, the information contained in their columns must necessarily be often very brief, and in many cases they are not free from partisan bias.

Take, for example, ordinary plumbers or stoneworkers. If a free library is at hand, they can consult the latest works on their trade; they can from various books obtain considerable intelligence in regard to the substances and the matter of their work, and they can become, instead of mere automatic workers, who are commanded to do this and forthwith do it, intelligent workmen, understanding the mode and character of their work. We have taken an ordinary plumber as being one of the first examples that occurred to us; but it suggests this consideration, that comparatively few workmen understand the reasons for certain kinds of household arrangements and sanitary measures. How often must any householder have seen a workman who has gained the knowledge of his trade purely by a long apprenticeship at actual labour be utterly at fault when he has had to make up his mind upon some hindrance which a slight theoretical or systematic knowledge of his subject, such as could be gleaned from books dealing with sanitary, drainage, or other matters, in a plain form, and dealing with principles, would have enabled him to overcome at once. If a little consideration be given to this part of the subject, many illustrations of a more forcible kind than that which we have here put forward will occur to any intelligent reader. Take china or glass workers, and consider for a moment how, by the opportunity of studying or reading up the subject of china and glass, the mere mechanical details might have floods of light thrown upon them, and how a mere labour might become positively interesting; for we will venture to say that there are dozens of workmen engaged in these or similar trades who would be only too glad to have information thrown on the general theory and history of their trade if they only had the means of obtaining it in a definite, and clear, and accessible form. Take watchmakers again. What does the ordinary English watchmaker know of his brethren of the Black Forest, of the rise of that picturesque portion of the clock-making trade which has its head-quarters in the town of Tryberg, or in the neat village of Fürtwangen, amidst the bracing and pine-clad hills of Baden.

And that leads to the further consideration that when free libraries are accessible to the workmen of factories or other establishments for a particular object, those in authority at such places should take the trouble to compile from time to time lists of works dealing with the subjects of their trade which might be consulted by workmen desirous of knowing what are the authorities which throw most light upon the subjects of their daily labour. By thus enabling the workman to study his trade apart from its performance as a mere daily toil, we can scarcely doubt that in process of time the intelligence and the general intellectual condition of large numbers of working people would be improved and increased, and that by the agency of free libraries. We do not suppose for an instant that as soon as a free library is established in a town forthwith the whole class of workmen will be improved. But we do assert that in the long run a manifest improvement must by these means be brought about in the working classes, and that, at any rate, large numbers of industrial workers will be directly and indirectly benefited; and even if only this latter result were brought about it is a distinct argument in favour of free libraries, in which the cardinal principle should be, not to have a large collection of various kinds of books, but to have large numbers of books of actually the same kind; because the same books are almost certain to be required, since the same classes are the general readers. But we have no intention here of saying more on the management of free libraries. What we have been desirous of pointing out is the value which they can certainly be to working men, masons, or any other kind of artisans.

SALTBURN-BY-THE-SEA.

"Give me the luxuries of life," says one of Holmes's paradoxes, "and I will dispense with the necessities." In somewhat of unison with this, modern society grows more and more to demand that it shall be provided with the means of enjoyment in its annual holiday, and in comparison with its care for this it is to an extent careless about its dwelling-place in the longer and busy time of life. And where there are growing populations or centres of industry, one of the earliest requisites is some retreat from the din and the turmoil of toil, and thus we have our growing bathing-places and health-resorts. There has been during about thirty years a very great development of industrial life, and a consequential growth of population, in the Cleveland district; and it was inevitable that with this there should be an enlargement of the facilities of enjoyment for the populace. Saltburn is the chief of the new watering-places which have been constructed with this view, and its promoters were unquestionably wise in their choice of site. From a breezy cliff-top, on which it stands, the eye falls down the bushy and wooded slopes of a little ravine, through whose depths a stream warbles, and beyond the cluster of dull cottages, with once-ruddy roofs, and the conical eminence through whose herbage the red soil penetrates, there is southward a rising ground, of shades of glowing green, of rich fallow fields, and of a few clumps of green trees. Looking to the east, in the distance, the ranges of terraces of one of the mining villages breaks in upon the emerald, and the tipping cradles and tall chimney at the mouth of the mine are marked upon the slope of the hill, whilst, as the eye follows on, it takes in a streak of agricultural land, and then the lattice work of the iron bridge that crosses the glen conducts us back to the town. Ranging east, we notice the black huts of the coastguard, and the red cliff, which juts out a bold precipice into the sea. A great sweep of blue ocean stretches out from the mass of sea-weed and mussel which darkens the foot of Huntcliff, and which retreats from the sands that stretch in yellow firmness along by the ancient village of Marske to Redcar. Ranging due east from Huntcliff is the great treasure-trove of Cleveland, whence is drawn wealth that in part sustains the watering-places of the north-country coast, and which has been peopled and developed to an extent certainly unsurpassed in industrial annals In consonance with the rapidity has been that of the growth of Saltburn. Almost hidden from view from the top of the cliff, behind the eminence called Cat Nab, are half a dozen quaint old cottages fronting the sands, and ever in the sound of the monotonous song of the waves which, at high water, beat up close to their foundations. These cottages form "Old Saltburn,"—once a renowned little smuggling village, where many and many a cargo has been "run." But fifty years ago the star of the illicit trade set, and Saltburn sank into obscurity, from which it did not emerge till fifteen or sixteen years ago. A company was formed to improve the natural beauties of the place, and to provide some of those accessories which, in watering-places of this generation, have become necessary. There on the cliff,—an eminence of some 150 ft. in height,—in 1861, the late Earl of Zetland laid the foundation of one of the chief architectural attractions of the place,—the hotel,—taking its title from the nobleman named. Its proportions and its architectural beauties entitle it to no mean place amongst those caravansaries of travellers in which Shenstone found the "warmest welcome." Its main front is five stories high, and nearly 200 ft. long, broad terraces running along front and side; whilst there has been not only the provision of architectural beauty and the choice of a site commanding natural beauty of no mean order, but also those requisites which modern taste make requisite for comfort and convenience. Next the promoters of the place seized upon the little ravine which runs down to the coast immediately below the hotel, and transformed it into pleasure-gardens, the terraces being laid out with great taste, and the background being a dense mass of foliage, struggling up the steep sides of the dell, whilst temples, summer-houses and seats, fount and rosaries, add to and emphasise its natural beauty. The valley widens, and grows more picturesque, reaching, a mile or so from the sea, the once hidden, but now well-known, sylvan beauties of Marske Mill.

To this seaside retreat the terminus of the railway was extended, and soon crescents and terraces began to arise; a pier was planned and executed, and the nucleus of a town speedily grew by the side of the railway,—a town designed for a health resort, built with that view, and hence in appearance the streets, even the humblest, have some pretensions to neatness, whilst in all cases sanitary needs seem to have been studied. A curious taste has given to the streets on the north of the railway the names of precious stones, and thus Garnet, Ruby, and others slope down from the line to the sea-banks, whilst a little more to the west, a small dell, called Hazeldean, shuts off the town from the agricultural country to the west. Near this, private munificence has erected a convalescen home,—a retreat for those recovering from illness, which is stately in appearance in its creamy front and stony-grey tiles, and which has also all provision for the needs of those recovering from illness. Early, the munificence of a few Episcopalians gave to the little town the benefit of a place of meeting for those o their faith, and it is almost needless to say tha Dissent in some of its most prominent phases was speedily represented by local habitations as well as names. School accommodation has been provided, the gas consumption is large and is fully met, whilst from the moors an abundant supply of pure water has been drawn. And, looking alike to ample provision for the needs of residents as well as for those of visitors, it may be said that this community has acquired practical completeness, but there cannot be a doubt that in the future there will be an enlargement of its boundaries.

Unquestionably, Saltburn derives its chief attractions from its situation, though there has been a judicious improvement of some of its advantages. From the highest point of the town, a glance shows the advantageous situation; the position high up amongst the breezes that blow from the moors; the long, firm sands that

stretch from Huntcliff towards Teesmouth; the magnificent prospect on every hand,—taking in the commencement of the new land "whose stones are iron," the pleasant villages that impinge on the coast, and the iron-making district, cloud-compelling, beyond the mouth of the Tees, as well as that which Ulysses saw when it was his purpose to sail "beyond the sunset, and the baths of all the" eastern stars. With the varying of the seasons—in the shelter it has in winter, its coolness in spring, its languor in summer, and its grateful wave-lessened sultriness in autumn—there are variations in its attractions, just as over its seaward prospect there sweep the changes of clouds and mists, of sunbeams that dance on the empurpled waves, and of boisterous gales that sweep into great breakers of the ocean, and drive to northern or southern havens the fishing fleets; but in all there are the beauty and the variations which ocean changes give to what would otherwise be monotonous.

THE OBELISK.

The preparations for raising the obelisk are proceeding apace. The four main uprights of the staging, each consisting, as we have already stated, of six sticks of timber, each 1 ft. square, are in position, and the iron jacket, consisting of plates and girders, is being fixed round the central portion of the obelisk. The iron "strap" which will pass under the butt end of the obelisk from two opposite sides of this jacket (in order to prevent the monolith from slipping out) is of ¾-in. metal, and 24 in. broad. We have already so fully described the mode to be pursued in raising the obelisk (see p. 679, *ante*), that we need not say more at this time than that the apex of the stone, when erected, will be about 30 ft. higher than the upright main timbers of the scaffolding. Instead of raising the obelisk in a horizontal position for the entire height necessary to allow it to turn on the trunnions of the iron jacket to a vertical position, the expediency of allowing the butt-end to trail the ground, or rather a platform to be erected for the purpose, is being discussed. By this means its perpendicularity would gradually increase with the height to which the girders supporting the trunnions were raised, until, when they had reached the maximum altitude required, the monolith would have acquired a perpendicular position by the mere force of gravity,—the iron jacket encompassing the central portion of the obelisk being, of course, so placed as to allow of the preponderating weight of the butt-end of the obelisk asserting itself. This modification of the plan has been suggested by those who entertain doubts as to the capability of the scaffolding to sustain the operation of turning the entire mass on the pivots or trunnions at a considerable height. These doubts are not entertained by Mr. Dixon, the engineer directing the works; and if the proposed deviation of plan is made, it will only be with the view of making assurance doubly sure. The full-sized cast which is being taken for the South Kensington Museum is making good progress. A portion of the pyramidion has been washed and coated with a solution composed, it is stated, of beeswax dissolved in spirits of wine. Whatever the solution may have been [we could get no exact information as to this on the works], its application has had the effect of showing the colour of the granite, and the tone of the small portion of the obelisk so treated is in pleasing contrast with the dirty aspect of the monolith generally,—the result of its voyage.

We may add that the height of the pedestal will be about the same as that of the top of the ornamental lamps which stand on the Embankment wall. The inscription to be placed on the pedestal is, we believe, not yet fully determined upon. The Metropolitan Board of Works, at its last meeting, passed the following resolution:—

"That, previously to any inscription being placed on the pedestal of the Obelisk (Cleopatra's Needle), such inscription be first submitted to this Board for its consideration and approval."

We understand that the power of the Board to interfere in this matter will be disputed.

Buckland St. Mary.—A new stained-glass window has recently been erected in the north aisle of Buckland St. Mary Church, at the expense of Mr. Davis, builder, of Taunton, who restored and enlarged the church some years ago. The window has for its subject the building of Solomon's Temple.

STANCHIONS AND COLUMNS.

On looking over my old notes when I was a student, I came across the following remarks on the comparative strength of iron columns and stanchions, which, if correct, may be of service to others, and if incorrect, possibly one of your more scientific readers will point out the faults.

According to Rankine's formulæ for wrought iron, and Gordon's for cast-iron:—

$$W = \frac{C\,S}{1 + \frac{L^2}{cD^2}}$$ crushing weight in tons.

Where C = 36 for cast, and 16 for wrought iron; and c = 3,000 for wrought columns, or 400 for cast columns.

$$= 1{,}000 \text{ for wrought stanchions or } \frac{400}{3}$$

for cast stanchions.

S = sectional area of metal.

L = length of upright in inches.

D = diameter of column (or breadth of stanchion in above formula).

B = breadth of stanchion (in following formula).

t = thickness of metal in stanchion (in following formula).

If the same quantity of metal be used in the stancheon as in the column, then the strength of column is to the strength of stanchion as

$$\frac{cB^2D^2 + 3L^2D^2}{cB^2D^2 + L^2B^2}$$

For—

$$W = \frac{C\,S}{1 + \frac{L^2}{cD^2}} = \text{breaking weight of column.}$$

$$W = \frac{C\,S}{1 + \frac{3L^2}{cB^2}} \quad \text{,,} \quad \text{,,} \quad \text{stanchion.}$$

$$\text{and } \frac{\text{breaking weight of column}}{\text{ditto stanchion}} = \frac{\frac{C\,S}{1 + \frac{L^2}{cD^2}}}{\frac{C\,S}{1 + \frac{3L^2}{cB^2}}} = \frac{1 + \frac{3L^2}{cB^2}}{1 + \frac{L^2}{cD^2}}$$

$$i.e., = \frac{cB^2D^2 + 3L^2D^2}{cB^2D^2 + L^2B^2}$$

Now we want to know when to use the column and when the stanchion; in other words, when there is an advantage in the use of the column over the stanchion, or *vice versâ*. At some point, if any, the column and stanchion will be of equal strength or bearing power, if any point, it will be when—

$$\frac{c\,B^2D^2 + 3\,L^2D^2}{c\,B^2D^2 \times L^2B^2} = 1$$

i.e., when $3\,L^2D^2 = L^2B^2$

or when $B = D \times \sqrt{3} = 1{\cdot}732$ times D.

Since the sectional areas are equal, therefore

$$\frac{\pi}{4}(D^2 - d^2) = 2\,Bt - t^2 \,*$$

and $B = \sqrt{3}\,D$; therefore

$$t^2 - 2\sqrt{3}\,Dt = -\frac{11}{14}(D^2 - d^2)$$

$$t^2 - 2\sqrt{3}\,Dt + 3\,D^2 = \frac{31}{14}D^2 + \frac{11}{14}d^2$$

$$t = \sqrt{3}\,D \pm \sqrt{\frac{31}{14}D^2 + \frac{11}{14}d^2}$$

For example, if the diameter of a hollow column be 10 in., and the thickness of the metal be 1½ in.,

then $B = 17\frac{1}{3}$ in.,

$$\text{and } t = 17\tfrac{1}{3} \pm \sqrt{\frac{3100}{14} + \frac{539}{14}}$$

$$= 17\tfrac{1}{3} \pm \sqrt{\frac{3639}{14}}$$

$$= 17\tfrac{1}{3} - 16\tfrac{1}{9}$$

$$= 1\tfrac{2}{9}$$

That is to say, that a stanchion 17⅓ in. wide, and 1⅔ metal will be of the same weight-bearing power as a hollow column 10 in. diameter and 1½ in. metal. In an 18-in. wall the stanchion would bond in well of the above scantling, whereas with a 9-in. wall it would be awkward. Tables of strength of columns are given in Hurst and other handbooks; by the above formula, having found the required section of column, it is easy to transpose it into the proper section for a stanchion.

L. S.

* The section of stanchion is assumed to be +. If I section then the short arm is assumed equal to $\frac{B+t}{2}$

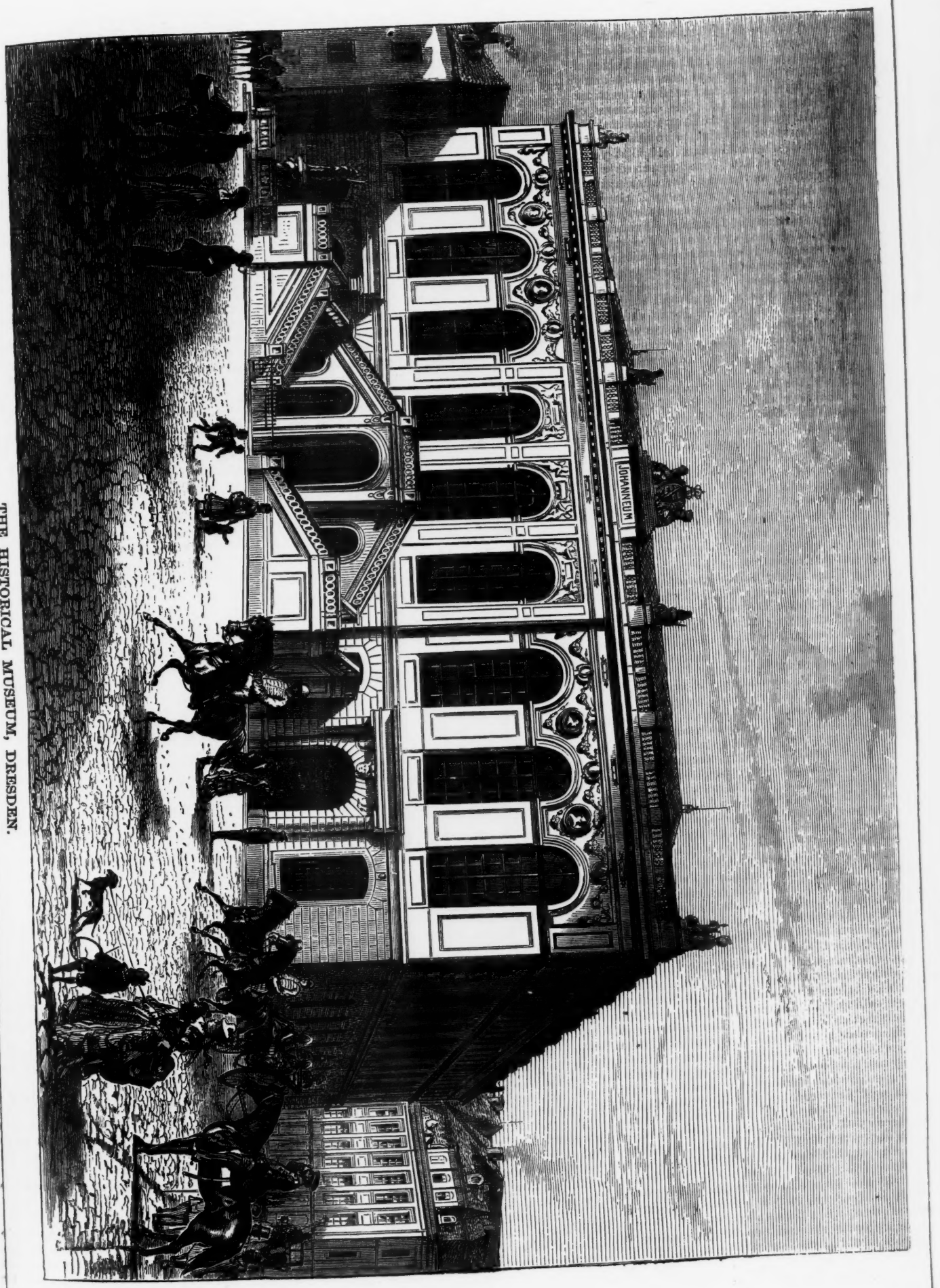
THE HISTORICAL MUSEUM, DRESDEN.

Already at the beginning of last century the museums of Dresden have ranked with the long-renowned collections of Italian cities—formerly alone the high-schools for artists and connoisseurs—and have ever since continued to enjoy the recognition and admiration of lovers of art. After the various royal art-collections, in the course of years, had been considerably augmented, and arranged in such a manner as to satisfy all reasonable wishes, the task still remained to the General Direction of the Royal Collections of Art and Sciences of rendering the treasures they contained more accessible to the public, and of advancing the real object of the collections, which consists in supplying examples upon which to work. By this arrangement students are now enabled to become better acquainted with the existing treasures of art of former centuries; they are able to collect useful suggestions for original work; and they receive stimulation for developing good taste. At the same time, works were published which faithfully represented to the eye the creations of former periods of art; and thus a rich collection of photographs of the principal objects in Dresden museums has been gradually accumulated, which now furnish the artist and artisan alike with the desired guidance for study.

Quite recently, two of the most important collections of Dresden, the Historical Museum and the Porcelain Collection, have experienced an essential change by their removal to the Museum Johanneum. The buildings of the Zwingergebäude and the Japanische Palais were very badly adapted for receiving objects of the description they contained, more especially on account of their dampness. The latter gave rise to great difficulties in the way of their preservation, causing such anxiety to the General Direction as at last to decide it, after transferring the paintings to the New Museum, to utilise the vacated space by building a second story for the reception of the two collections; tastefully decorated rooms were created, which made a suitable display of both collections possible. The Historical Museum received a most remarkable decoration in the shape of the cartoons illustrative of the history of Charles the Great, Friedrich Barbarossa, and Rudolf of Habsburg, which were drawn by Julius Schnorr von Carolsfeld for the frescoes now gracing the walls of the Royal Castle at Munich. The Museum was fortunate enough to get possession of them, and still more fortunate in providing the great wall-spaces necessary for their proper exhibition, which was obtained by utilising for their display the full height of both stories in the rooms bordering on the staircase.

The Historical Museum occupies now, compared with its former arrangement, a much better position, due regard having been paid to the relationship of the respective arms and to their chronological display. In the interest of the craftsman, the artistic work of the armourer of the sixteenth century has been grouped in tasteful cases in such a manner, according to their handiwork, as to afford a consecutive view from the engraved and damascened arms of iron to those worked and etched in silver; and elegant sword-hilts, valuable shields, helmets, &c., have been placed so close to the beholder as to give the fullest satisfaction to the lover of art.

The General Direction, in rearranging the museum, has not lost sight of the events of modern times. It applied to the Saxon War Office for a grant of arms captured in the late Franco-German War. The arms supplied from the Dresden Arsenal in consequence of this request have been used in erecting a war trophy in honour of the German armies. There is also a complete collection of small-arms as now used by the European armies, a collection which it is intended to supplement by the latest inventions as they are introduced. The Turkish tent captured at the relief of Vienna in 1683 has been restored to its original form, the impression caused by this rich piece of Eastern ornamentation being thereby greatly enhanced.



THE HISTORICAL MUSEUM, DRESDEN.

The Collection of Porcelain and Vases has also gained considerably by its present rearrangement, the greater portion of space at disposal having permitted a chronological and systematic display.

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

We have the utmost pleasure in announcing the brilliant success of the Congress of Architects which has been opened at the Palace of the Trocadéro this week, as one of the many and eminently practical and useful attractions of the Paris Exhibition. The organisers of this somewhat vast and ambitious undertaking were at first rather doubtful as to its success. In 1867, during the Exhibition held that year, a small congress had been organised at a moment's notice, and some of the more notable foreigners who were then visiting Paris were persuaded to attend. But this was a haphazard gathering when compared to the great concourse which we have just witnessed. The present Congress was opened on the afternoon of Monday, the 29th ult., in one of the four large lecture-rooms of the Palace of the Trocadéro. The programme was rigorously executed. M. Lefuel, Member of the Institute, and President of the Organising Committee, occupied the chair, as announced, and delivered the opening address. At his side, and acting as vice-chairmen, we noted M. Charles Blanc, of the Academy of Fine Arts; M. De Laborde, Permanent Secretary of the Academy of Fine Arts; M. Strohm, of St. Petersburg, Councillor of State, &c.; M. Boëswillwald, Inspector-General of Historical Monuments. The secretaries were M. Charles Lucas, M. Cernesson, and M. Raulin. Thus, in the space of a few feet from each other, we found grouped together representative men, whose names are known in various parts of Europe. The audience was very numerous; the majority of the adherents, who now number about 500, were present, for the room, which was quite full, must have held some 400 persons. Among these many foreigners of distinction were noted. We recognised, for instance, Señor Villajos and Señor Belmas, of Madrid; Señor Salas, of Tarragona; M. Ropett, of St. Petersburg; M. Langlet, of Stockholm; M. Dietrichsen, of Christiania; Señor Da Silva, of Lisbon; M. Warocqué, the Belgian Royal Commissioner; M. Massarani, President of the Fine Arts group; Mr. R. Phené Spiers, and many others.

When the President had concluded his opening address, M. Charles Lucas gave a lucid and effective summary of his secretaryship; and, finally, M. Achille Herman, architect of the Tower of Paris and the Nanterre House of Correction, read a brilliant paper on "Æsthetics for the Million," which was loudly applauded, and helped to stimulate the flagging energies of the members, who, in many cases, were weary, after long journeys from the provinces and abroad.

It was only on the second day that the business of the Congress began in real earnest. The morning sitting, held at the Tuileries, was most animated, and some very notable speeches were delivered on Question No. 3, which relates to the position of the architect as a professional man. Messrs. Couran and Dumont were the first speakers, and insisted on the importance of compelling architects to earn and obtain a diploma before they are allowed to practise in their calling. M. Langlet then rose, declaring that practice had proved in Denmark that diplomas were not of much use; and M. Strohm, though not so emphatic, admitted that in Russia they had not been of much greater service; but the speech which created the greatest impression was delivered by Mr. R. Phené Spiers. It was M. César Daly, editor of the *Revue Générale de l'Architecture et des Travaux Publics*, who suggested that Mr. Spiers should be called upon to explain the position of English architects and English architecture, on the ground that he had enjoyed the benefits of education both in England and in France, and could therefore compare the two systems.

In order to account for the development of English architecture, and show how slight influences change our system, Mr. Spiers said that there was no real school of architecture in England. There was no foundation for studies that might serve as a basis on which to build a new system. The schools at South Kensington only aimed at instructing masters who go to the provinces to teach in the provincial schools, and this did not amount to anything more than mere drawing from casts. In England, a youth, on leaving school, enters an office, pays a premium, and is then informed by the principal that he must not expect any lessons, but must simply content himself by watching the work that goes through the hands of his employer. The youth, therefore, only acquires the knowledge of routine daily business; nor do more than twenty or thirty per cent. of the students avail themselves of the evening classes to complete their architectural education. The Architectural Association, Mr. Spiers also pointed out, was a peculiar society, framed, formed, and carried on to correct the defects of English architecture, and probably in no other profession, and certainly in no other country, could such an institution be found. A certain number of students also joined the Royal Academy Schools, which Mr. Spiers himself has directed during the last seven years; and he begged the audience to believe that here, at least, the designs given to the students do not consist of the traditional subjects, such as a house for four brothers, a casino in a park, and the other unpractical structures which find so much favour in the eyes of French examiners. The entire absence of system in England had not, however, interfered with the production of such men as Sir Charles Barry, Cockerell, Sir Gilbert Scott, and others. Mr. Spiers then launched forth into a more speculative, and at the same time, more interesting phase of his subject. He dwelt on the enormous influence literature had exercised on architecture. The works of Stuart and Revett, Pugin, Ruskin, and Sir Walter Scott, and the recent great religious movements, had all helped to create schools. Then there had ensued the anti-Gothic reaction, and the introduction of what is called Queen Anne style, but which it would be more correct to define as the architecture of the Stuart period. This, and the great influence of brick decoration on design and modern work, were also explained; and, finally, the speaker concluded by expressing his conviction that a purer style will soon find favour, and we shall probably take the works of Duc, Duban, Labrouste, and Vaudoyer as our models.

Practically speaking, all the discussion has led to was the adoption of a somewhat colourless resolution, which was solemnly carried, with only one opposing vote, at the afternoon sitting. It is urged that the societies of architecture of France shall place themselves in communication with foreign and provincial architectural societies, and study and decide the question relating to the giving of diplomas to architects.

The Congress has many other grave matters to discuss before it can conclude its labours; and if it continues as successfully as it has begun, this great meeting will be a success.

INTERNATIONAL CONGRESS OF SURVEYORS.

In Paris, on July 18th, 19th, and 20th, an International Congress of Surveyors, convened by the Central Committee of the Surveyors of France, was held, forming one of the series of congresses held at the Palais du Trocadéro, by authorisation of the Minister of Agriculture and Commerce.

Representatives from England, Italy, Germany, Belgium, Spain, and Switzerland took part in the proceedings. In response to an invitation from the president of the Société des Géomètres of France the Institution of Surveyors of London sent three delegates, viz., Mr. E. Ryde (vice-president), Mr. Charles J. Shoppee (member of council), Mr. J. W. Penfold (honorary secretary), together with Mr. J. C. Rogers (acting secretary).

At the first day's sitting the congress was constituted, under the presidency of M. Lefèvre de Lucy, president of the Central Committee of the Surveyors of France. An executive committee was next appointed, composed of vice-presidents, one nominated by each nationality, Mr. Ryde being the English representative. M. Lefèvre was then chosen, by acclamation, president of an international committee for the permanent supervision of the objects of the congress.

The second and third days were occupied in considering the various questions proposed for discussion by the French committee. These related:—1st. To the adoption of some guarantee of professional competency; 2nd, to the comparative merits of the cadastral surveys of the various countries represented at the congress; to the improvement of the methods of property registration, as practised on the Continent, and to the best form for the public maps, plans, descriptions, and valuations of the various kinds of landed and house property as a basis for the equalisation of taxation.

The English Delegation laid before the congress a statement descriptive of the position and functions of the various branches of the profession in England.

In the course of the discussion the Ordnance Survey of England was described, as also the English system of valuation for the purposes of local and Imperial taxation. English Ordnance maps on the various scales were presented to the French Central Committee, together with copies of the published volumes of the Transactions of the Institution of Surveyors.

The articles of discussion prepared by the French committee were (with certain modifications) accepted in the form of resolutions. The establishment of a permanent International Congress, with the following representatives as a provisional committee, with power to add to their number, was agreed to:—President: M. Lefèvre de Lucy, France. Vice-Presidents: MM. Bucaille, Havre, France; Edward Ryde, England; Dr. W. Jordan, Carlsruhe, Germany; Paul de Jaer, Brussels, Belgium; Dionisio Casanal, Saragossa, Spain; Raphael Tarantelli, Teramo, Italy; and Redard, Fribourg, Switzerland; and MM. Pottier, Villers Cotterets, Aisne, and Hatchet, St. Quentin, Aisne (secretaries); and Derivry, Noyou, Oise (treasurer and editor of the *Journal des Géomètres*).

The proceedings of the congress terminated with a vote of thanks to M. Lefèvre de Lucy (the president), proposed by Mr. Ryde and carried by acclamation.

After the conclusion of the business the foreign delegates were entertained by the French committee at a "*Banquet confraternel*" at the French Restaurant in the grounds of the Exhibition, and about 150 members assembled. The English deputation were placed on the right, the Italian on the left, of the president. After dinner, M. Lefèvre was presented by the surveyors of France with a gold commemorative medal. The utmost cordiality marked the whole proceedings, and the objects with which this interesting congress took place were in every respect achieved.

On the Monday the various representatives attended at the Tuileries to confirm and sign the minutes of the congress.

THE RUDOLF FOUNTAIN, INNSBRUCK.

The monumental fountain of which we give an illustration has been erected at Innsbruck in commemoration of the union of the Tyrol with Austria. On September 29th, 1363, Margaretha, called "die Maultasch" (literally "the pocket-mouth," on account of the abnormal size of her mouth), renounced her claim to the duchy of Tyrol, depositing the government of the country into the hands of Duke Rudolf IV. of Austria, of the house of Habsburg. Five hundred years later, on September 29th, 1863, on the occasion of the solemn celebration of the fifth centenary of the union of the Tyrol with the Austrian monarchy, the erection of a commemorative monument was resolved upon. The unveiling of the monumental fountain, which is placed in the Margarethenplatz at Innsbruck, did not take place until September 29th of last year. Plan and design were prepared by Herr Friedrich Schmidt, Cathedral Architect, Vienna. The statue of Rudolf, about 9 ft. high, and the other metal figures and ornaments, were cast at the Imperial Art Foundry, Vienna. The sculptor, Grissemann, a Tyrolese, supplied the design for the statue of Rudolf, from a portrait on the sepulchral monument in St. Stefan's Cathedral, Vienna. The stonework, of Lofer marble, has been executed by the sculptor Hohenauer, of Innsbruck.

Communication in Kensington.—At the meeting of the Kensington Vestry on the 25th ult., a memorial was read from the inhabitants of Brompton-road, Brompton-square, and the neighbourhood, complaining that there is no communication between them and Rutland-gate, Ennismore-gardens, &c. The only way at present was a footpath through Brompton Churchyard, or a circuitous route through Montpelier-square, and so on to the Exhibition-road. The memorial was referred to the Works Committee. The want has been long felt, and often urged.

THE RUDOLF FOUNTAIN, INNSBRUCK.—Dombaumeister Friedrich Schmidt, Architect.

TRINITY CHURCH, SOUTH HAMPSTEAD.—Mr. Henry S. Legg, Architect.

TRINITY CHURCH, SOUTH HAMPSTEAD.

The church, of which we present an interior view, is erected in the parish of South Hampstead, upon part of the estate of Sir Spencer Wilson, bart., adjoining St. John's Wood.

It has been substituted for a small timber temporary church, erected some thirty years ago at the lower end of the fields so well known as "the Conduit-fields" leading to Hampstead, and which erection has served the purpose of a temporary church to three congregations, each now duly supplied with permanent buildings, but which has just been swept away for the large and (possibly in the future) noble avenue, 70 ft. wide, called Fitz-John's Avenue, connecting Hampstead with London.

The Rev. Henry Sharpe having attracted a small congregation in the temporary church; and this congregation being desirous of continuing his ministration, applied for a site for a permanent church to the late Sir Thos. Maryon Wilson, bart., who, in conjunction with his son, the present Sir Spencer Wilson, readily granted it free of all cost. A district being assigned out of the parish of Hampstead, with the sanction and approval of the late vicar, the first stone of this structure was laid by the Earl of Shaftesbury.

Externally, the church is not at present specially attractive, on account of the want of the tower and spire, which it is hoped will be shortly erected. The interior, however, has been studied, more particularly with reference to the great desideratum of accommodating a large congregation with comfort as regards space, seeing, and hearing, ventilation, warming, easy ingress and egress, &c. To effect this, the nave has been designed sufficiently wide to accommodate the greater part of the congregation under its roof. The pillars carrying the nave walls or clearstory are of red polished granite, in order to admit of their being of as small a diameter as possible, so as not to intercept the view of those sitting in the aisles, and at the same time to be sufficiently strong to carry the clearstory walls over, which are lofty, and 2 ft. 6 in. in thickness.

The church will accommodate 1,000 people, all on the ground floor. The length is 128 ft. from east to west, including the chancel, which is 36 ft. long. The width from north to south, including the aisles, is 65 ft. The height of the nave from the floor to the apex of the roof is 70 ft. There is at the west end a narthex or porch, 34 ft. long by 9 ft. wide, and a north porch besides; also another entrance under the tower, on the south side. At the eastern end there is a chancel-aisle, an organ-chamber, and a vestry.

The style adopted is the Transitional from Early English to Decorated. All the tracery work, mullions, arches, capitals and corbels, are of stone. The walls internally are of brickwork, a great portion, especially of the nave, being in Pether's patent bricks, pressed with a pattern or design upon each, combined with bands of bricks of a purple colour running throughout. The roofs of the nave and aisles are of fir, boarded. The chancel, however, is vaulted, having moulded stone ribs, and the spaces filled in with brick; the thrust being amply provided for by projecting buttresses around the apse.

The exterior is of Kentish rag and Caen stone. The warming is a combination of hot air and hot water, the apparatus being a chamber forming the foundation for the tower.

The total cost up to the present time is about 13,000*l*. The chancel, together with chancel aisle, organ-chamber, and vestry, it may be stated, was a gift of one lady, the separate cost being about 3,500*l*. The pulpit, which is of stone, with polished marble shafts both below and above, is the gift of Mr. Robert Woodd, in memory of his father. It has around it six panels, carefully carved, illustrating events in the life of St. Paul. The font also, which is elegant and simple, is the gift of Mr. Ewan Christian.

The builders were Messrs. Dove, of Islington; and the architect was Mr. Henry S. Legg, of Christ's Hospital, London.

Kirbymoorside, near York.—A vicarage house is in course of erection for this benefice, at a cost of 2,000*l*. The architect is Mr. J. Mitchell Bottomley, of the firm of Messrs. Armfield & Bottomley, of Middlesbrough-on-Tees. The contractor is Mr. Thomas Wood, of Pickering.

TOWN SANITATION AND MORTALITY: LIVERPOOL.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

The fifth annual meeting of this association was held on the 25th ult., in the Council Chamber of the Town-hall, Liverpool. Some routine business having been transacted,

The president (Mr. Deacon, borough engineer of Liverpool) delivered his inaugural address, of which the following are passages:—

In assuming, for the first time, the chair to which you have done me the honour to elect me, I wish to welcome you heartily to the second city in the kingdom, and to express the hope that you will not fail to find in Liverpool some works worthy of your thoughts, and to acquire some new and useful information such as I have invariably gathered in the different towns which, on similar occasions, we have previously visited. The first Public Health Act was passed in the year 1848, and by this Act, and the Towns Improvement Act of 1847, the appointment of surveyors was authorised in the towns and districts to which those Acts were applied, for the distinct purpose of carrying out the practical work involved in the improvement of the sanitary condition of the country. As a class of engineers and surveyors, therefore, our existence dates back for only thirty years; and it appears to me that no small credit was due to the municipal government of Liverpool when, six years earlier, they obtained a local sanitary Act, the provisions of which were so well considered by the Council of the day that many of them have not been improved upon, and are to be found in the most recent sanitary legislation. Under this Act I believe the first borough engineer was appointed. No class of men know better than do we ourselves that the choice of candidates to perform the duties of our office has at all times been the happiest, and that in many instances the standard of professional knowledge which sanitary authorities have succeeded in securing has been far too low. It may be that the standard has generally been as high as the remuneration could reasonably be expected to command, but if that standard were raised, the remuneration would inevitably rise also, for in the long run there is little to be feared from the competition of those whose practice is obsolete among professional engineers. The members of this association (and I am happy to say that we include the engineers and surveyors to nearly all the principal urban and sanitary authorities in the kingdom) meet together, from time to time, to widen our knowledge by visiting each other's districts and works, by examining the causes of increased efficiency or diminished cost, and by thus adding the experience of our neighbours to that which is gained in the comparatively limited sphere in which our individual duties lie. You have each received a printed account of some of the various works which I shall ask you to inspect. From that account you will be enabled to gather information not only concerning the existing state of sanitary engineering in Liverpool, but also concerning the changes which have been effected within the last few years. Before asking you to consider the works, I will endeavour to show you that, judged by the mortality of Liverpool, the existing state of sanitary engineering is satisfactory, and that, judged by the decrease which has recently taken place in that mortality in relation to other places, there is the best reason to conclude that the changes described in the paper before you have given most important and satisfactory results. Excepting the soil upon which Liverpool is built, there is not, I believe, in the physical geography of the district anything calculated to produce an abnormal death-rate, but the soil is for the most part unfavourable. The rock is everything that can be desired; but over this rock (the new red sandstone) lies in most parts a thick bed of the absorbent but nearly impermeable boulder clay of the glacial period. Before the borough was almost entirely covered with buildings and pavements, a large portion of the 30 in. of rainfall absorbed into the boulder-clay by capillary action, rather than by percolation, was slowly restored to the air when rain had ceased, and produced an abnormally damp climate. But there is a social, and perhaps more important, element which should be taken into account in considering the death-rate. We have among us a large and ever-changing population of seafaring men, and we have in addition a proportionally large migratory population. Consider for a moment the effect of a multitude of persons moving continuously through the town, to many of them the first dry land for weeks past, to many others the last dry land for weeks to come. Obviously the number of invalids left behind at different times, and enumerated by the census on a single night, is higher than the actual average number of invalids corresponding to the number of emigrants in the town on any one night. The number of deaths resulting from those invalids must, therefore, be also higher than the mean death-rate of the population producing them. There are also many other circumstances connected with a migratory and, in great part, very poor population, which are inimical to the health of residents themselves. But there is a third and still more important cause tending to increase the death-rate in Liverpool. I refer to the very small area within the municipal boundary in relation to the population. The population of the borough of Liverpool is about 532,885, the area only 5,210 acres, giving a mean density of 102·3 persons per acre. If we take the seventeen other large English towns which are the subject of the Registrar-General's special reports, and with the death-rate of which that of Liverpool is compared, we find that the total average density of population in them is only 33·6 persons per acre, or less than one-third of the density in Liverpool,—a density, be it remembered, arising in a great measure from the fact that the borough of Liverpool is only the nucleus of a very large dependent population, which in most towns is included within the municipal boundary. If, notwithstanding this unfavourable mode of comparison and the other adverse circumstances to which I have adverted, it can be shown that the total death-rate from all causes is not exceptional, and that the deaths from those diseases which are generally regarded as dependent upon sanitary measures are actually less than in most other towns, there will, I think, be an additional reason for believing that the municipal engineering work of Liverpool is worthy of your consideration. In an address which, as it appears to me, is among the ablest to be found in the archives of any association, Mr. Hawksley, as president of the Health Section of the Social Science Congress in 1876, compared the total mortality of Liverpool with that of the other large cities most nearly approaching to it in magnitude, namely, Manchester and Glasgow, and from the year 1869 to 1875 inclusive, he found from the Registrar-General's official returns that the mean annual death-rates of the three cities were almost exactly alike. Liverpool gave 30·1 deaths to each 1,000 persons living; Manchester, 30·1 per 1,000; Glasgow, 30·5 per 1,000, or 30·1 deaths in Liverpool, as compared with a mean of 30·3 deaths in Manchester and Glasgow. Since the date of Mr. Hawksley's address, two more years have passed, and the death-rate of Liverpool still bears the comparison satisfactorily. I will now give you the mean annual death-rates from 1869 to 1877 inclusive:—Liverpool gives 29·4 deaths to each 1,000 persons living; Manchester, 29·7 per 1,000; Glasgow, 29·3 per 1,000; or 29·4 deaths in Liverpool, as compared with a mean of 29·5 in Manchester and Glasgow. Even from this comparison it is evident that Liverpool is not, when compared with other similar places, the abnormally unhealthy city which people are in the habit of supposing it to be. But, as an Association of Sanitary Engineers, it appears to me that we may more usefully investigate the mortality from certain zymotic diseases which are generally believed to be affected by such surrounding conditions as a sanitary authority can control. Now, if we comtrast the mean death-rate of Liverpool for the years 1875-6-7, and the first quarter of 1878, from scarlet fever, diphtheria, fever, and diarrhœa, with the corresponding death-rate in the 17 towns already referred to, we find that in only seven of those towns is the death-rate lower than in Liverpool, though the mean density of population in Liverpool is three times as great. It is clear, therefore, that in contrast with other towns Liverpool is not in an unsatisfactory sanitary condition. If we compare the mean death-rate in Liverpool, above referred to, with the corresponding death-rate for the five previous years,—viz., 1870-71-72-73-74,—we find a diminution of 46 per cent.; while in the corresponding periods the mean diminution in the other seventeen towns is only 23 per cent. For so exceptional a change in Liverpool we naturally seek for a visible cause. I am aware that the periods

compared are shorter than they ought to be for purposes of the kind; but, if I go back ten years from 1874, instead of five, I find the comparison still more favourable to the more recent period. Now, the division of the two periods of which I have compared the mortality from certain zymotic diseases was a time when many important sanitary works were in progress, or about to be commenced. I will enumerate a few of these:—81 miles of sewers in the heart of the town have been thoroughly ventilated; 44 miles have been thoroughly cleansed; a large proportion of the whole have been renovated and rendered self-cleansing, as explained in the paper before you; and others have been provided with flushing-tanks, and are now systematically flushed; 300,000 square yards of pavement, formerly pervious to moisture, have been reconstructed, and rendered impervious. The connexions between 1851 drains in the cellars of court-houses (the traps of which were often defective) and the sewers have been cut off, and pneumatic separation between drains within and without dwellings of all classes is now common, though far from universal, as it ought to be. Under the medical officer's advice, large numbers of insanitary cellars have been closed; and during the last eighteen months, 2,178 of the remaining privies have been converted into water-closets. I will not ask you to believe that the whole of the greatly reduced mortality from zymotic diseases is due to the sanitary changes I have enumerated, though I think you will agree with me that the coincidence indicates a very important connexion between them. I will only say, in conclusion, that, although much good work has already been done, much still remains to be done. There are defects in the sanitary works of the best of our towns, to which the eyes of our legislators and the public must be more fully opened before the remedy will be found. We are still very far from the Hygeia which has been pictured by Dr. Richardson in such glowing colours; but, however sceptical we may be of the immunity from certain diseases promised there, and of the greatly extended life of man under such conditions, we cannot, as municipal engineers and surveyors, do better than conceive for ourselves a city in which all public works, and I am bound to add certain private works, have been executed in the most perfect manner, and to raise to that standard, so far as possible, the centres of population, in connexion with which each of us holds so important a trust.

Mr. Charles Jones (Ealing), the hon. sec., regretted that the president's address precluded any discussion: it was a fixed rule of the association's throughout the country not to allow discussion on the president's opening address. During the reading of the paper they had learned more about Liverpool than they ever knew before. He moved a vote of thanks to the president for his able address.

Mr. Ashmead (Bristol) seconded the motion, which was carried unanimously.

Discussion was then invited upon a communication by Mr. Deacon with reference to the works of Liverpool. The paper was read by the secretary, and the president answered a large number of questions on the following subjects:—Portland cement for carriage-way foundations; bituminous concrete for carriage-way foundations; sett pavements, with asphalte joints; artificial asphalte pavements; the Liverpool tramways; sewerage construction; improvement of old sewers; sewer ventilation; influence of form on strength of cement; the general utility of the test for strength; difficulty of testing on small works; simple modes of testing; Portland cement setting; the Bootle Waterworks; the waterworks appliances at the Hotham-street depôt; meters for measuring trade supply of water, &c.

A vote of thanks was passed to the president for his valuable communication and the questions which he had so kindly answered.

In the evening the members dined at the Alexandra Pavilion, Eberle-street, Mr. Deacon presiding. After the loyal and patriotic toasts, Mr. Pritchard (Warwick), district secretary for the Midland Counties, proposed "The Past Presidents," coupling with it the name of Mr. Ashmead (Bristol), the immediate past president.

The President next proposed "The Municipal Institutions of the Country." He explained that his Worship the Mayor of Liverpool, who intended to respond to this toast, had been unexpectedly prevented from attending the banquet. He would therefore call upon Dr. Gill to reply to it.

In the course of his remarks, Dr. Gill said there were a great number of dwellings in Liverpool which were not fit for the habitation of beasts. These were occupied by the lowest order of the people, and they ought to be removed. It was a pity the corporation could not afford to raze them without delay; he hoped they would be able to do so before long. In conclusion he proposed the "Worthy Secretary," coupling with it the name of Mr. Jones, who, in responding, hoped that before long the Association would have amongst its members all the principal engineers and surveyors in the north, south, east, and west of England, so that its powers might be proportionately increased.

The Chairman gave "The Representative Body of the Association," coupling with it the name of Mr. Lyster, the engineer to the Dock Board, who, in replying, inviting the members of the Association to visit any of the works over which he had charge in the Dock Estate.

Amongst the other toasts was that of the "Medical Officers of Health," to which Dr. Taylor responded.

The concluding toast was "The President," which was proposed by Mr. Lyster.

THE GEOLOGY OF LIVERPOOL IN RELATION TO ENGINEERING WORK.

ASSOCIATION OF MUNICIPAL ENGINEERS.

At a meeting of this society last week, Mr. T. Mellard Reade, C.E., read a paper on the above subject, in which he classified the various strata, commencing with the post-glacial strata. In the course of it he said, speaking of the

Boulder-clay and Drift-sand,

The thickness of these drift deposits varies from nothing to about 140 ft., the deepest I know being in the old bed of the river Mersey, under the town of Widnes. Near the north docks the stony clay appears to graduate into gravel, which fills up deep gullies cut into the sandstone rock. This bed of gravel has been quite a godsend for the formation of concrete for the dock works, of which a large quantity has been used for backing for the walls. The neighbourhood is deficient in a natural supply of shingle, most of that used in Liverpool coming from abroad as ballast. The bulk of the clay is of a more plastic character than the foregoing, and is often separated from the lower beds by a line of denudation and a thin seam of stratified sand; but it is very difficult to lay down any general rule for the geological interpretation of the deposits.

It is very singular in excavating in the town of Liverpool to come upon these relics of a period of floating ice. This I exhibit is a chipping from a glaciated erratic of porphyritic felstone, which was found in the excavation at the corner of Victoria-street, where it had lain embedded at the base of the clay under the cellars of some very old property. Another and larger erratic was found in the same place, half embedded in the red sand which often lies on the top of a red rock, between it and the boulder clay above. A still larger greenstone boulder was found in an excavation in Hackinshey, and they are, in fact, common under the foundations of Liverpool.

Triassic Rocks.

These rocks, when reached, of course, in all cases terminate our digging for foundations. A word as to their economical aspect. They constitute the whole of the local stone, and many of the beds form very good building stone; but, in consequence of its porosity, which makes the rock such a good water-bearing stratum, it is apt to convey the damp into a house; in fact, it should never be used unless backed up with brickwork. The white stone of which Compton House is built is from the Stourton quarries, in Cheshire; and some of the old Liverpool buildings are of similar stone, from equivalent but harder beds in Liverpool, from quarries now closed, and, indeed, built over. The stone generally used now from the neighbourhood is that of the pebble beds of the Bunter. Messrs. Wells & Sons' quarry at Bootle supplies a great deal of this rock for the north end dockworks. There is also a fine red stone from the Runcorn quarries, which can be obtained in very large blocks, and is free from pebbles. It belongs to the Keuper division.

I have refrained from saying anything on that vexed question—the water supply from the new red sandstone—as my views will be published in the forthcoming report of the British Association. In conclusion, I would commend the study of geology to engineers and architects.

After a short discussion, in which Mr. Isaac Roberts (Liverpool), Mr. Morant (Leeds), Mr. E. Pritchard (Warwick), Mr. White (Oxford), and Mr. Lemon (Southampton) took part, thanks were voted to Mr. Reade, and a strong wish was expressed that some steps should be taken to reproduce the drawings by which it was illustrated for the benefit of the Association. Mr. Reade stating his readiness to place them at the disposal of the Association with that view.

The meeting then adjourned.

In the afternoon the members of the association paid a visit to the Bootle pumping-station, where they were met by Mr. Councillor J. H. Wilson, chairman of the water committee; Mr. Alderman Rigby, deputy chairman; Councillors Roydon, Graves, and Barkley Smith; Mr. A. Duncanson, C.E., deputy water-engineer; Mr. Joseph Parry, C.E., assistant water-engineer, &c. A heading or underground reservoir, the lowest floor of which is 105 ft. below the surface, and the length of which is 440 ft., the breadth 18 ft., and the height 26 ft., was brilliantly lighted up by means of the electric light, and the members of the association having descended into it by means of a series of steep ladders, were conducted through it by their president, Mr. Deacon, who explained the mode in which the water enters the heading, and the method of gauging the flow from the different parts. There are several boreholes in the heading, the deepest of which is about 630 ft. from the surface. The process of sinking the 1,000 ft. borehole was also exhibited and explained. The borehole is 26 in. in diameter, and has already been sunk to a depth of 960 ft. The apparatus used in boring is a modern application of the old Chinese rope-boring machine. The machinery is designed by Messrs. Mather & Platt, of Salford, the contractors for the work, and is very ingenious. After leaving the waterworks the party proceeded, in the omnibuses which had taken them thither, to the North-end Docks, in course of construction. Mr. Lyster, the dock engineer, received them and explained to them the plans of the works, and afterwards conducted them through the culverts and sluices. The visitors inspected this portion of the works with great interest, and one and all appeared to be much struck with the massive,—the Titanic,—character of the masonry and the completeness and perfection of the sluicing arrangements.

THE RECENT TRIAL OF COWLS AT KEW.

The recent report, published under the auspices of the Sanitary Institute of Great Britain, upon certain exhaust cowls or ventilators, which were exhibited at the Leamington Congress, in connexion with that society, has necessarily led to criticism. The Sanitary Engineering and Ventilation Company, in some remarks made by them, say:—"The gentlemen who conducted the trial found, as the result of their experiments, that the exhaust-cowls did not give so good a result as a plain or open pipe, and it is not at all surprising that such should have been the case under the circumstances. There was a building standing alone in an open space, with nothing to interrupt the free course of the wind currents, and it is well known to those who have studied the question, that under those conditions, viz., with a current of air blowing horizontally across the top of an open pipe, an open pipe gives the best result. This was pointed out by Dr. Parkes years ago, and has been repeated by others since,—the little toy, known as the 'Spray Producer' being a practical illustration of the principle involved,—but these are not the conditions under which nine out of every ten exhaust-cowls are placed,—at any rate in towns, because of some higher adjacent building, or a wing of the building, or a chimney stack, against which the wind strikes, and which produces reflex action; the air being deflected at various angles by these and similar obstructions, and which is the chief cause of down-blow in certain chimneys. Now, exhaust cowls, or ventilators, which are dependent upon the wind currents for their use, have been designed with the view of getting the best possible upcast or pumping action, and at the same time providing against down-blow, the arrangement being such that at whatever angle the wind strikes them, it should not be able to blow down the vertical pipe or tube to which they are attached, as it would frequently do in

the case of an open pipe. This being so, it seems an extraordinary statement to issue from the Sanitary Institute, that the only object these exhaust-cowls appear to serve is to prevent the admission of rain, which, they say, could be accomplished in a much less expensive and simpler manner. To those who understand the subject, it seems unnecessary to point out a fact so evident as that we have named, but for the non-professional public who have been persuaded to go to some expense in fixing these exhaust-cowls on their dwellings, it may be as well to state the fact with the same publicity which has been given to the result of the Kew trial. We had not the opportunity of witnessing the trials, but, if we are correctly informed, there were other reasons why the open pipe at Kew gave a better result than the exhaust-cowls, chiefly the arrangement for the influx of air to the shed, on the top of which the cowls were placed; and we believe that a gentleman who carefully inspected the arrangements, and took some readings there on his own account, intends publishing in the technical papers some figures which he thinks will conclusively prove the fallacy of the verdict pronounced by the sub-committee of the Sanitary Institute of Great Britain."

THE ST. GOTTHARD RAILWAY.

The question which is at present uppermost in the public mind of Switzerland, and which is also of the greatest interest to foreign countries, is the supplemental subvention which the increase in the expenses of the St. Gotthard Railway has made necessary. Our readers need perhaps reminding that, in consequence of the unexpected difficulties in the construction of the St. Gotthard tunnel, the original estimates have been considerably exceeded. The Governments of the countries most interested in the works, Germany and Italy, are quite willing to furnish their quota of the necessary additional funds. Strangely enough, the country which will ultimately profit most by the completion of the railway has, up to the present time, refused to furnish its share. The sum required of Switzerland is only eight million francs, no very great burden for the country, notwithstanding that it has already supplied twenty millions towards the works. The Federal Council thought of overcoming the old jealousies between the East and West of Switzerland by giving the cantons most nearly concerned the opportunity of raising themselves the supplementary funds. This endeavour has been completely wrecked. The two railways most interested, the Central Railway of Switzerland and the North-East Railway, were quite ready to accept the additional burden, notwithstanding that they have been passing through heavy crises; all they asked was that the Federal Government should find them the money until they were able to repay it. The only difficulty rested with a dozen or so of cantons, who could not be induced to subscribe their quota, even after, at a last conference, the Federal Government had offered to take a few millions on its own account. It is this spirit of public niggardliness which lies at the bottom of much of the procrastination and delay already experienced in the completion of the St. Gotthard Railway. It is a strange phenomenon that the cantons farthest away from that line (Solothurn, Baselstadt, Basselland, Aargan, Schaffhausen, and Thurgau) have been all along most ready to help in the common work; the resistance comes from those nearest to it. At the head of the opposition is the most ancient of the oldest cantons, the canton of Uri, within whose circumscribed limits the chain of the St. Gotthard rears its icy pinnacles. All possible interests, both ideal and material, ought to have induced that canton to make a last sacrifice. But, no; the majority of the Landsgemeinde at Altdorf,—that Altdorf which was, if tradition is to be relied on, the cradle of Swiss independence,—have resolved not to give another franc. The same is reported from Nidwalden, in whose mountains was born the man who knew how to "make a way for liberty." Schwyz and Obwalden distinguished themselves, however, by voting in favour of the subvention. Another category of cantons shielded its parsimony behind a feeling of displeasure, either natural or assumed, at the limitation of the proposed network of lines feeding the principal railway, although common-sense ought to tell them that all the branch lines will be built as soon as the trunk line is completed. The cantons loudest in this strain were Tessin and Luzern, Zug and Bern joining in. But there is every reason to believe that the second category might have been gained over if the Federal Government had taken over a considerable portion of the supplementary convention, and thus morally compelled them to agree to it. It was then that happened what no one had expected. Zürich, the second largest and the richest canton, the canton considered the most educated and most liberal, the canton most interested in the St. Gotthard Railway, rejected the supplementary convention by popular vote, even after its Cantonal Council had recommended its acceptance almost unanimously. The secession of Zürich overthrew all former combinations. It might have been possible to again appeal to the people, but time pressed, more especially as the German and Italian Parliaments had voted the supplementary amounts demanded of the two countries. The Swiss Federal Council resolved to do without cantonal help, and to assume the responsibility of finding the funds itself. No doubt is expressed as to the action of the Federal Council being ultimately approved. All the chances are in its favour. The cantons which were willing to contribute directly, as well as most of those which objected to this course, will probably not find fault with the whole Republic accepting the responsibility of supplying the money. Should there still be any cantons refusing to sanction even this course, they will find themselves in a miserable minority.

ENGLISH LANDSCAPE ART IN THE YEAR 1878.

For the third time, Mr. Alfred Dawson publishes his notes under the above heading,* slashing right and left, sometimes with and sometimes without reason. We quote his opening observations:—

In reviewing the position of landscape art this year, there is no new feature to remark particularly; though by careful inspection it will appear that some small changes have taken place, and these changes, on still closer scrutiny, will bear out the statement that they are of an improving kind. For a long time we have had to record, along with the better report, one of another kind,—a report of treachery to art, and falsehood to nature. The wilful defection of a man from canons of truth which can have no other interpretation than that for which his fellows and himself have laboured to approach, is a sin and an evil done to the fair name of art: not that a man ought to be in any way pedantic or conventional, but that he should not be the cowardly, false being that alone would be able to do such a thing, as when he goes and represents nature diametrically opposite to her real character and appearance. Except one at the Grosvenor Gallery, there does not appear, at the present time, any conspicuous case of this sort; and this one we have, let us hope, learned to tolerate at least, as we do some poor deformed and demented creature who needs the pity and charity of other people to keep him, though not to necessarily lodge him in a palace and feed him on the best of everything, and make the largest show possible of his hideous presence, as if he were a noble type of humanity.

The perpetual hankering after this kind of trash appears to be subsiding and making way to a good deal of real painting from nature on the spot, which is a far better thing. It is infinitely better to make a bad picture painted on the spot than a worse one painted on the smudge.

There is, however, large room for complaint on that most important point, dignity of subject. This appears to be now quite forgotten; the meanness of many of the landscape subjects is indeed something for condemnation. See if there is one fine distance in the whole Academy, or one splendid tree, or one noble sunset, or, indeed, daylight sky. The only approach we have to dignity is in the few Alpine pictures, not the best that we have seen, though good, and a couple of Venetian subjects hung badly. If one were inclined to be ironical, it would be quite appropriate to recommend some splendid dog-kennel or dust-hole well worth a large canvas and a month's work. Now, while this is so, it is all very fine for the art critics to talk their smoky learning about Mr. Millais's little rivulet or Mr. Aumonier's big foregrounds, but it cannot make dry bones live, and no amount of flattery can convert a sketch into a picture; the flatterer will disappear, the artist will follow, and the picture will remain a wretched, unprotected failure, which the far-scattered few who might say a word for it will certainly never care to defend for an instant. Now this is, of course, doubtless, very nice for men who only have the one idea of getting money out of the pockets of the public. Such men, whether artists or dealers, or the still more delicately suspended "gentleman dealer," need no hard-and-fast criterion, and sublime excellence they do not care much for, but their desire is a name that is capable of any amount of inflation with a proportionate supply to meet the demand which they whip up; a very sorry kind of thing for benefiting art and artists.

Now for all this, speaking to artists, there is but one remedy: be free from the charge yourself, and refuse to do anything with those who desire to so treat you. Never mind specious promises or any other adventitious aid to profit, but paint the best picture you can. Get for it the best price you can, and put by all the pictures you can against the time when you may be glad to have them. The desire to sell out can only mean that you have no faith in your own productions, so you get to regard them as a tradesman regards damaged goods. Men who paint rubbish must be ashamed to meet their own pictures again, but men who paint good pictures are always glad to see them again. That there is a canon of excellence and value, and a clear line of truth in art, if a few men would but follow it closely and insist on its right to be respected, there cannot be a shade of doubt. And just as last year, in this pamphlet, a few points were taken up bearing on this part of the subject, so now it will be somewhat further elucidated.

As it is easy to criticise a result placed before one, but hard to create the object, it is no ungraceful duty in the same way for any one who undertakes technical criticism, as far as possible to give some guiding clue as to certain principles of subject or aspect which are needful to produce good pictures. There are also conditions of working and practice which it would be well to observe as being incompatible with a real genuine producing genius.

Now many painters seem to lack and others to have most fully developed the important idea that there must be in every picture some one pronounced aim or object, whether grand or mean, complex or simple, but, whichever it is, there is no harm done by allowing it a dominating place. At the same time, it is a matter of absolute choice whether some one aim or two or three should obtain in the same picture. It neither disqualifies nor makes a picture, whether this is carried out in one form or the other. But there is a great exception to be taken from this point, namely, that when a picture has several aims or objects, it is harder, very much harder, to do than when it has only one. The very lowest form of value or attraction in any picture is that where the subject and the working are reduced to a minimum, while some cant phrase in the title of the picture is set to do all the work that the artist left undone. Of such as this are Mr. Watts's dove subjects, Mr. Whistler's Nocturnes, and a few other solidified vacuities which turn up from time to time. The next class above this, and not much above it, is that in which there is almost as little subject, but the cant title is omitted, a locality is suggested, and some pronounced aspect of nature is at best represented, yet the sky is *nil*; the rest of the picture is little enough, and we are asked to praise it greatly. Of such are various Daubignys, Corots, and sundry other late evening effects, or effects of fog or moonlight, which the reader may discover for himself. Next above this class, we place those pictures in which some one aspect of nature is really well done, being copied on the spot from nature. This is not a very high class, because there are technical reasons why certain great qualities should not be obtainable, except by a carefully-cultivated power to express them independently of their presence. The only things that can be got well by copying are such things as do not change,—rocks, trees, and material generally, always under some effect that can be seen any time. Thus Mr. Brett likes clear sunshine because it can be easily referred to, and it must be equal and universal for the same reason; and other painters from nature go in for flat, clouded shade, for the same reason. These are low art; they are simply copying nature when pinned out and pasted down flat, so that she cannot give their fancy any trouble,

* Deighton & Dunthorne.

but can be copied as a Kensington student copies a scroll or a conventionalised botanical design. This is all a poor form of art, that is, it is not high; perhaps, putting it fairly, it is about half-way between the top and the bottom,—whether in art an inch at the top is worth two at the bottom shall be left to the reader to judge.

THE HYGIENE OF EDUCATION.

Sir,—In these days, when events move so rapidly, and when the elaboration of ideas still remains a comparatively slow process, I should be glad if you would favour me by giving publicity to the following principles, which are the substance of an attempt to place the science of education on a more exact basis than has hitherto been done.

Regarding the human system as a divine mechanism, I have long thought that it would tend to promote a truer comprehension of the science of education if we were to study the subject from a more mechanical point of view,—if we were to consider every thought and every act as the equivalent of a certain amount of vital force expended,—and the due share of power to be utilised by the brain as a limited quantity, capable of being either monopolised or proportionately distributed amongst all faculties. That the brain power in every individual is limited is no mere assumption, for we all know that there is a point at which it begins to flag, a second where it begins to show marked signs of distress, and a third where it exhibits all the signs of total exhaustion. Our mental as well as our physical power is limited. There is a supreme effort, beyond which we can no further go. Let us then, first of all, regard the total vital force in each individual, from the cradle to the grave, as a fixed quantity, and the use and distribution of this sum total as a force which is capable of either an economical or of an extravagant expenditure. In considering the human system as a mechanism, however, we must not forget that it is a sub-system,—that it is a portion of a more colossal system,—of the solar system. Let us, therefore, turn our eyes towards, and contemplate the celestial mechanics, to see whether there be not some correlation between the laws which regulate the expenditure of power in the Cosmos, and in the Microcosmos? The recognition of such a correlation is inevitable, after the most cursory glance, and forcibly impresses us with the simplicity, the unity of nature.

Now, what is that great principle which strikes us in a general survey of astronomical science, from the movements of the planets to the fluctuation of the tides? Is it not this: that the total power of the solar system is a fixed quantity, and that all cosmical phenomena fluctuates within definite limits, and that whatever fluctuations take place in that system in excess of a certain mid, mean, or average range, must be *compensated* at some time or other by irregularities as much in defect? That is to say, if any unusual manifestation of power be made in some special portion of the system, that can only take place by a deprivation of force somewhere else in that system. It is by this method of *compensation*, this great restorative of hygienic principle, if I may so express it, of the solar system that the stability of the mean amongst all the aberrations and fluctuations of that system is preserved, and that astronomers are enabled to calculate events that have happened, and events that are to come. For, if the sum total of the power of the solar system were not conserved,—if there were any appreciable and marked abatement in this quantity,—there would be no precise recurrences, no precise periodic times, and the prediction of solar events, with anything like accuracy, would be impossible. No excessive manifestation of force, therefore, can take place in any special direction in the solar system without that being accompanied or succeeded by an equal degree of abatement or deprivation of force in some other and opposite direction. Any planetary aberration in *excess* of its *mean* orbit must be compensated at some time or other by one as much in *defect*.

In the human system, as in the solar, excessive action in one direction is followed by exhaustion or defect in another; excessive elevation of spirits by depression; excessive attention on the part of one sense by inattention or obliviousness in others; an excessive absorption upon one object by indifference or neglect of others. And do we not, on the certainty of the principle of re-action or of compensation, predict that when we see a man running to one extreme at one time, we shall see him coursing to the very opposite at another? In fact, you shall find that nature in her organic systems cannot exceed everywhere at once; but only somewhere and some when, at the expense of some other where and of some other when. Through all her vicissitudes she must be reinstated and her equilibrium in the aggregate restored by that principle of compensation we have indicated. The well-being, both of the solar and of the human systems, consists, not in a series of irregular and extreme changes, but in the preservation of an even tenor of moderate variation. The preservation of this compass would appear to be the goal of "progress" of the Cosmos.

Having shown that the expenditure of power both in the solar and the human systems obeys similar laws, let us proceed to roughly enunciate those laws.

Of the Solar System.

1. The total force in the solar system is a constant quantity.

2. There cannot be an excessive demonstration of force in every part of the system at once. The total force must either be proportionately or disproportionately distributed. An excessive demonstration of force in any special direction in that system disturbs its even tenor and perfect well-being.

3. The *mean* activity of every faculty of the system would, according to the laws of probability, be the best. Experience confirms this view, and shows that the normal *mean* of any fluctuating faculty of the solar system cannot either be exceeded or fallen short of but by the disturbance of the *mean* state of some one or more faculties of that system.

Of the Human System.

1. The total life force of a human being is a fixed quantity. This force may be utilised either by fast, moderate, or slow degrees. By moderate degrees is, by the law of probability and the testimony of experience, the best.

2. Any daily consumption of the total vital force beyond this moderate degree, beyond nature's just dole, would be at the expense of the future; any slower expenditure would tend to conserve energy.

3. Every thought and every act is an equivalent of a certain amount of force expended.

4. Any excessive expenditure of vitality by the body leaves less available for intellectual purposes. Any excessive expenditure of energy by the brain leaves less available for the purposes of the physique. Any attempt at a simultaneous and excessive use of both would be destructive.

5. One portion of the system may be stimulated to excess by suppressing the vitality of another. The intellect by the abatement of the physique, the physique by the abatement of the intellect. That is to say, power may be abstracted from one portion of the system to aggrandise another. A man may transfer his vital power, if not wholly, in greater part either to the intellectual, physical, or sensual side of his nature. But should he attempt to exceed in all at once, his fund of vitality would soon be used up. A pyre lighted in several places at once is soon consumed.

6. Health, then, mainly depends upon the fair distribution of vital energy between the intellect and physique.

7. Any excessive consumption of vital energy by a faculty, or a set of faculties, must be compensated by a period of inactivity or rest in that faculty or set of faculties.

8. The great question of educational economy, then, is the greatest amount of health to the greatest number of faculties; or, in respect to educational training, the greatest development to the greatest number of faculties. Now this greatest development to the greatest number can only be attained by the due, the right, or the moral use of each; in other words, by a fair distribution of vital energy amongst the whole. For any one faculty being stimulated to consume more than its due share would do so at the expense of the rest,—a procedure which would be injurious both to that stimulated to exceed, and to those deprived. A due distribution of vital energy amongst all the faculties is that which the law of probability and the testimony of experience indicate as the best.

The discussion of these principles of the hygiene of education may be left till another opportunity. We may note, however, that the last, which gives the best general statement of the great principle of educational economy, is correlated with the main principle of another economy,—political economy; for what is health or perfectness to the greatest number of faculties but a slight modification of Bentham's axiom, of "the greatest happiness to the greatest number"?

W. Cave Thomas.

THE NEW ELEPHANT AND CASTLE THEATRE.

The Elephant and Castle Theatre in the New Kent-road, Newington, which was recently completely destroyed by fire, the bare walls excepted, is to be rebuilt upon a plan which is thought to be an improvement upon that of the old structure, and the works have been in progress about a fortnight. The designs for the new building were prepared by Mr. Robinson, whose very sudden death has been recorded in the *Builder*. The plans have been approved by the Lord Chamberlain and the Metropolitan Board of Works, and in the erection of the building Mr. Robinson's designs will be strictly adhered to. The building is intended to be carried to a greater height than the old theatre, and will also be of much greater strength, with numerous spacious entrances and exits to and from all parts of the house. In the erection of the new house the main walls are to a great extent being entirely reconstructed. The boundary-wall at the rear of the stage has been altogether taken down, and is now being re-erected in a much more substantial manner than was that of the old building. It is being built on a foundation of concrete, and footings 4 ft. in width, and 11 ft. in depth below the ground line, the wall itself being 18 in. in thickness. In addition, the side walls are for the most part being rebuilt, every part where they were at all scorched by the fire being restored and made good, and this involves almost the entire rebuilding of the upper part of the walls, which was condemned by the architect. These walls will be carried several feet higher than those of the old house. The tie-beams, roof-principals, main rafters, and collar-beams are 12 in. by 8 in., and 12 in. by 6 in., and the other timbers in proportion. The timbers and iron columns and girders supporting the various portions of the auditorium portion are likewise intended to be made equally strong, whilst the whole of the floors of every part of the house will be of fire-proof construction.

From both sides of the pit there are exits direct into the street, 5 ft. 6 in. in width, in addition to which there are three ground-floor entrances and exits, common to dress-circle, pit, and gallery, when necessary, these several exits being each 7 ft. wide. From the gallery there are four distinct and separate entrances, each 4 ft. wide, in addition to passages under the gallery communicating with the main exits, and it is calculated that in case of fire the theatre, if full, could be entirely cleared in ten minutes.

The contractors for the building are Messrs. W. Bracher & Son, of Great Ormond-street, who have undertaken to complete the works in time for the opening of the theatre early in November. Mr. J. H. Watson, who has superintended the erection of several theatres designed by the late Mr. Robinson, is clerk of the works. The interior fittings and decorations will be executed by Messrs. Pashley, Newton, & Young, of Red Lion-square.

Whitechapel Churchyard.—In the Consistory Court, on the 29th ult., before Dr. Tristram, the Chancellor of the Diocese of London, an application was made on behalf of the rector and churchwardens of St. Mary, Whitechapel, for a faculty to take a part of the churchyard to widen Whitechapel-road and Church-lane as a public improvement. A sum of 2,000*l.* would be required, and the Metropolitan Board would provide one-half. It was also proposed to lay out the remainder of the churchyard as an "ornamental garden," after the tombstones and human remains were removed to another part of the churchyard from the portion now required. The Chancellor directed the faculty to be issued within three weeks.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

The third annual meeting of this Society commenced on Tuesday, in Bristol. The general meeting of the members and associates was held at half-past twelve, in the Guildhall, the chair being taken by Sir William V. Guise, bart., the president of the Council.

Alderman Jones, on behalf of the Mayor and Corporation, welcomed the society to the good old city of Bristol.

The general secretary (Mr. Palmer Hallett) then read the third annual report, which contains the following passages:—

"The council of the Bristol and Gloucestershire Archæological Society may continue to congratulate the Society on its satisfactory condition. The Society, at its very successful inaugural meeting in this city, in 1875, reached the number of 400 honorary and subscribing members. It now counts 512, including 500 subscribers, and these numbers, if not showing an increase since the last annual meeting, fill up losses and maintain the substantial position then attained. The finances, too, are sound. . . . . Among the personal losses which the Society has this year suffered, is that of its president (the late Earl Bathurst). . . . . Among other losses the council have to deplore are those of the Rev. W. H. Bathurst, of Lydney Park; Mr. Richard Mullings, of Cirencester; and the Rev. J. G. Joyce, of Strathfieldsaye rectory, Hants. . . . . For a report of the work accomplished during the year, the council would refer to the volume of Transactions, the first part of which will shortly be published. The Cirencester meeting introduced the Society for the first time to the great evidences of the Roman occupation of the Cotswold hills, and especially manifested the striking frequency of early Norman work in these higher regions of our district. At the beginning of the year a winter meeting was held at Gloucester, where a temporary museum was formed, and some very valuable papers were read. Full reports of these meetings and papers will be contained in the volume. . . . . The council hold the annual volumes to be among the best evidences of the Society's efficiency and utility. The monographs they contain will constitute a valuable portion of the work which the Society originally put before it as one of its chief aims, viz., 'the collection of materials for an improved county history,' and towards such an aim as large an expenditure as possible will prove the best economy. The last volume was brought out chiefly under the direction of the Gloucester local committee, and to Mr. John Bellows many acknowledgments are due both for the good workmanship it displays and for other special services rendered in its preparation. This year they have asked Sir John Maclean, F.S.A., to undertake the editorship of the volume, and they believe that the work, when it appears, will justify them in the satisfaction they feel in his acceptance of this post. In the furtherance, also, of the above-mentioned object, namely, the collection of materials for an improved county history, the council have printed and circulated a scheme of archæological inquiry, consisting of questions calculated to bring out the various antiquities existing in the different parishes of the county."

The report having been adopted,

Sir Wm. Guise introduced Mr. Christopher J. Thomas, who had been elected by the Council as Earl Bathurst's successor in the presidency of the Society.

Mr. C. J. Thomas then proceeded to deliver the following address:—Archæology, which had until comparatively recent times been the study of but a few, and was mainly confined to an acquaintance with the antiquities of Egypt, of the Greeks, and of the Romans, has in later years become the interesting and fascinating pursuit of an ever-widening circle of votaries, many of them men of learning and erudition, zealously occupying themselves with this branch of science, not only in Europe, but wherever civilisation has extended. As the knowledge of the structure of the globe on which we are placed and its varied conditions in ages, or, may I not say, in æons long past, has been obtained by the researches of geologists among the strata of which its surface is composed, so the archæologist, when he has discovered the works or the remains of ancient man which by good fortune have not been destroyed or disturbed, accumulates the facts of such discoveries, and deduces from these facts a far wider and more accurate knowledge of the early condition of humanity than was previously possessed,—a knowledge stretching back far behind the age of letters or of the most primitive records. As instances of the value of recent archæological research and its results, allow me to mention the discoveries of Dr. Schliemann in Greece and of Mr. Wood at Ephesus. By means of discoveries such as these, and others of still earlier periods, we are enabled to trace back the progress of humanity, which from its beginnings is shown to be of low type and of great rudeness, and we can compare those times with these our later days,—days in which sciences and arts have tended in their development to a vast improvement in the moral, the mental, and the material condition of mankind. I must confess that the views which I thus briefly allude to are those which for me constitute the chief interest of archæology; but the programme laid out for the present session of your society is mainly of a modern date. We are about to visit some of the Mediæval buildings of Bristol and its vicinity. I am far from saying that any of these should stand injuriously in the way of modern comfort and convenience, or be hindrances to the requirements of the present and the future; but as far as possible these memorials should be preserved with loving care. We are in old Bristol and in old Britain. Our inheritance from the past is a rich inheritance. If our ancestors had, as men, their faults and their failings, let us not dwell upon these needlessly, let us rather sustain the fine buildings and the worthy institutions they have left us; let us keep alive the munificent charities, not in a literal spirit, but maintaining them as we believe our forefathers would have carried them on in the lights of a later age. And not only in Bristol, but in the wider extent of the fine old shire of Gloucester, which is the sphere of our Society, may the veneration of the past lead us so to act that the future may have reason to look back with complacency on our deeds and monuments. If we act in such a spirit our Society will have a life of usefulness, and render itself worthy of present and of future success.

The members then left the Guildhall, and at two o'clock they proceeded to view Canynge's house, in Redcliff-street.

At half-past two the party repaired to the Redcliff Infant Schoolroom, where luncheon was provided by the Mayor.

The visitors then proceeded to St. Mary Redcliff Church, where the Rev. Canon Norris read a paper descriptive of the church. He first described the tower, which, with its steeple, was 300 ft. in height. It ranked with England's stateliest towers, and was a complete work of art, separate from the church. It belonged to the very purest epoch of English architecture. One of the puzzles of the church was whether there ever had been a complete spire. He thought it was clear,—for evidence existed in the Bodleian Library,—that a spire was originally attached to the tower, but was destroyed in 1445. Architecturally and historically there was undoubted evidence of the fact. He then proceeded to give a sketch of the church in historical order. He gave a slight reference to the connexion of the unhappy poet Chatterton with the parish. He said that thirty years ago the church was in a ruinous condition, but it had been restored under the superintendence of Mr. G. Godwin, the carving having been entrusted to Mr. Rice, a master mason worthy of the name. An Early English porch had been discovered, and that must have led into an Early English church; but there was no record of that church, and there was no account of it in the archives of the parish. There were traces of this thirteenth-century church, however,—not the church of the Canynges, but of the Berkeleys,—the number one church, as Mr. John Taylor rightly called it. In the Mayor's Calendar, dated 1376, there was a record that William Canynge built the body of the present church from the transept downward. He was the grandfather of the more famous Canynge. That was the church number two, and traces of that church existed in the south part of the transept and nave. Why was the second church so soon replaced by the present church, which was in the Perpendicular style? The answer was forced on them that some catastrophe happened in the interval, and they had a record of a tremendous thunderstorm that threw down the tower, and wrecked the work that was being done to the old church. He then described the present edifice, mainly built in the fifteenth century. It exhibited traces of genius in its erection, and the richness and picturesqueness of its parts and the depth of its shadows might well be envied.

The next place visited was St. John's Hospital and Hermitage, of which Mr. John Taylor gave a description; and

At Temple Church the party were given a brief description of the fine old edifice by the Rev. W. Hazledine, the vicar.

The last place visited was the crypt of St. Nicholas, of which church Mr. J. F. Nicholls gave a short description.

The annual dinner of the Association was held in the evening at the Queen's Hotel, Queen's-road, the President in the chair.

An evening meeting for the reading of papers was held in the lecture-theatre of the Museum and Library.

Papers were read by Sir J. Maclean, F.S.A., on "Elmore and the Guise Family"; and by Mr. Thomas Kerslake on "The Historical First Cause of St. Werburgh's Church." The writer remarked that, having sometimes said that the date of the original foundation of the lately-demolished church of St. Werburgh was the year 741, and that a building so called had from that early date always stood on the spot, he had been asked how he knew it. He had answered, by the same evidence as the most important events of our national history were known, viz., by necessary inference from the very scanty records of those times, confirmed by such topical monumental evidence as might have survived. This fact was in itself of considerable importance to local history, because if it should be realised it would be the very earliest solid date that had yet been attached to the place we now called Bristol. Having dealt at some length with the early history of Bristol and its neighbourhood, the writer went on to state that there were still known in England thirteen dedications of churches or chapels in the name of St. Werburgh, although, perhaps, not more than half of them were any longer above ground. Seven of the thirteen were within the counties of Stafford, Chester, Shropshire, and Derbyshire; that was, they were within the original kingdom of Mercia; but the other six were extraneous, and three of them great stragglers. These must have owed their origin to political and military extensions of the influence of that kingdom, and they were found in places where Æthelbald, one of the three Mercian aspirants for the English empire, had made good a conquest, and might therefore, he believed, have been his usual method of making his mark of possession. Indeed, there could be little doubt that most of the seven that were found at home, within Mercia, were also of Æthelbald's foundation; probably all except the present Chester Cathedral, which arose out of the translation of her relics to that place nearly 200 years later.

Dr. Beddoe, F.R.S., next read a paper on "The Craniology of the Interments at St. Werburgh's Church."

On Wednesday the Society visited Westbury, Henbury, Blaize Castle, and Almondbury.

LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

The summer meeting of this Society has just been held at Cambridge. The whole arrangements of the proceedings were undertaken and admirably carried out by the Rev. S. S. Lewis, F.S.A., honorary secretary of the Cambridge Antiquarian Society.

The members and friends of the Society assembled at the University Arms Hotel, and first visited the various collections of pictures, statuary, and engravings, Mediæval illuminations, Greek coins, and local Romano-British antiquities in the Fitzwilliam Museum, throughout which they were conducted by the director, Professor Colvin.

After luncheon they were escorted by the Rev. the Master through the chapel, hall, library, &c., of Peterhouse, where the stained glass of the sixteenth-century east window commanded general attention, as did likewise the painted windows recently added from the designs of Professor Ainmüller, of Munich. At the adjacent church of St. Mary-the-Less, the vicar, Dr. Guillemard, was in readiness, and pointed out the gallery connecting church and college, and other interesting architectural features. The next point made was Queen's, the college of Erasmus, where Mr. Clarke and the Rev. A. Wright guided through the gardens, chapel-hall, and library of their Old House. In the library, amongst other treasures, there were shown a noble folio manuscript of St. Augustine, and a very interesting transitional Prayer-Book issued in the reign of Henry VIII. Thence passing through the quadrangle of St. Catharine's College, the visitors entered the library of Corpus Christi College, and inspected amongst the manuscripts the copy of the Gospels which St. Austin of Canterbury is said to have used, the original draft of xlii. Articles (1562), Bishop Clifford's Pontifical and the original Saxon Chronicle. Hence they passed through the ninth-century tower and restored church of St. Benedict, and attended the choral evening service in the chapel of Henry VI.'s "Royal and Religious" foundation, and afterwards inspected the curious passage between the ceiling and the roof.

The next day began with a visit to Gonville and Caius College, where Mr. Bensly, Fellow and Librarian, commented upon the portraits and

other treasures of the hall, combination-room, and library. Similar attention was received from the Rev. G. Atkinson at Trinity Hall, where the original method of securing books to the library-desks was shown and explained. After a few minutes under Dr. Luard's guidance in Great St. Mary's Church, Mr. Bradshaw (University librarian), exhibited and commented upon some of the most notable manuscripts and early printed books in the University library; and after a short visit to the Senate House, the party proceeded to Trinity College, where they were received by Mr. Cobb, Senior Fellow, and the Rev. R. Sinker, librarian of the college. The Rev. Professor Mayor and Professor C. C. Babington gave a lucid history of the architecture of St. John's College in its various stages, and especially of the new chapel by Sir Gilbert Scott, and of its predecessor. Early college plate, interesting manuscripts, and service-books were also shown.

After luncheon, Mr. Pattrick (Fellow of Magdalene College) exhibited and explained the most notable books and engravings in the Pepysian Library; whence, after viewing some traces of old Camboritum and the later fortifications of Castle-hill, the visitors inspected the very Early Norman Church of St. Peter, and its modern neighbour, that of St. Giles.

SUGGESTED GALLERY OF CASTS.

In the House of Lords on Monday evening, Earl Cowper asked whether, considering the admitted importance of establishing an historical gallery of casts from the antique according to the plan proposed by Mr. Walter Perry, the First Lord of the Treasury would take immediate steps to have a report prepared which could be laid before Parliament on the scope and limits of the collection, how it could be obtained, and the probable cost. The matter was one of the desirability of which there could be no question, and he was encouraged to make the application, which was simply for a preliminary inquiry, by two memorials in favour of the proposal. The cost of the establishment of such a gallery had been estimated at about 10,000*l.*, and South Kensington had been suggested as the most suitable site. The commissioners of 1851, and the authorities of South Kensington, were favourable to this, and the authorities of museums both in this country and on the Continent had expressed themselves willing to render assistance.

Earl Granville expressed the hope that the Government would entertain the subject.

The Earl of Beaconsfield said,—It is unnecessary for the noble earl to press upon her Majesty's Government the interest and importance of the object he has in view. There never has been any hesitation on the part of the Government on that head, nor do I think that there has been any difficulty on the question of expense. I do not wish to pledge myself as to detailed expenses, but I cannot imagine any difficulty on that account. The difficulty arose in this way. There are at this moment many collections and museums urging their claims upon the Government either for legitimate pecuniary assistance or for sites, and both these are difficult subjects to deal with. The expenditure for an object such as that brought forward by the noble earl may not be excessive, but it would form a precedent. There is another cause of delay, and I can say little more than I said at the end of March last, when I undertook the management of the business. Nothing of any importance has been done. Although several gentlemen have been applied to to form a treasury committee, nothing has been brought to a head, and the position of the question is much the same as at the end of March. It is an object the importance of which we quite appreciate, and I hope during the recess it will be brought to a satisfactory issue.

Dr. Chalmers.—On the 27th ult. a bronze statue of the late Dr. Chalmers was unveiled in Edinburgh. The idea of erecting the statue originated with the late Dean Ramsay, so long ago as 1869. The execution of the work was put into the hands of Sir John Steel, R.S.A. The statue, which is 12 ft. high, represents the doctor standing in a quiescent attitude, attired in the dress of a moderator of Assembly. The left hand supports an open quarto Bible, and the right is brought round over the top of it. The statue stands on a pedestal of granite 15 ft. high, the total height of the monument being 27 ft.

THE ASSOCIATION EXCURSION.

We give below the recently-issued detailed programme of this year's excursion of the Architectural Association to Hull and its neighbourhood. This will be the ninth of those excursions which the late Mr. Edmund Sharpe taught the members of the Association to manage and make good use of. It was one of Mr. Sharpe's many incompleted projects to make South-east Yorkshire the scene of such an excursion; he had indeed sketched out a provisional list of places to be visited. The Choir of Howden supplies matter for six plates; and the Choir of Selby,—the most complete of the Yorkshire abbeys,—for eight plates, in his "Parallels" (1848).

Monday, August 12, by carriages from Hull (Royal Station Hotel), to Preston, Burton Pidsea, Humbleton, Aldborough (lunch), Skirlaugh, Swine, Hull.

Tuesday, August 13, by rail from Hull (breakfast at 8.0), to Cottingham, Beverley, Hull.

At Beverley St. Mary's Church will be visited immediately on arrival. Luncheon at the Beverley Arms Hotel, at 2.0; and at 3.0 members will meet at the Minster (North Porch).

Wednesday, August 14, by carriages from Hull (breakfast at 7.45), to Hedon, Burstwick, Keyingham, Otteringham, Patrington (lunch), Hull.

Thursday, August 15, by rail from Hull (breakfast at 8.0), to Selby, Howden, Hull.

At Selby the Abbey Church will be visited immediately on arrival. Luncheon at the Londesborough Arms Hotel, at 1.0.

Friday, August 16, by carriages, rail, and boat, from Hull (breakfast at 8.0), to Barton-upon-Humber, Thornton Curtis, Thornton Abbey (lunch), Hull.

Saturday, August 17, Hull (breakfast at 8.30). Members will meet at Holy Trinity Church at 9.30, and at St. Mary's Church at 12.10. The remainder of the day may be spent in further examining the churches and other buildings of interest in the town. Luncheon at the Royal Station Hotel at 1.30.

The excursion party will set out from Hull at 9.30 a.m. on Monday, which will call for arrival on the 10th. Mr. C. R. Pink, of 22, Great George-street, S.W., is the honorary secretary for the excursion; and Mr. James Fowler, F.R.I.B.A., of Louth, will be the conductor. The president (Mr. H. L. Florence), the officers of the Architectural Association, the Scottish and Irish contingents, and a proper mixture of new men, will take part in this pleasant outing, to which, as of old, we wish all success.

A FRENCH "SCHOOL OF INDUSTRY."

The *Bradford Observer* publishes the report of a visit recently paid by a weaving overlooker from Bradford, Mr. Mitchell Stead, to the Municipal School at Rheims. The report was one of those submitted to the last meeting of the Bradford Chamber of Commerce, and contains some interesting matter. The School of Industry was the first one of its kind to begin at Rheims, and after it had been at work for some years, the promoters conceived the idea of giving technical instruction to boys, as well as youths and men, and from that idea sprang the Municipal School.

"This school is entirely under the management of the municipal body of Rheims. It is a much larger building than the other school, and more perfect in its internal arrangements. They admit boys from other schools at the age of twelve to fifteen years, and they have accommodation for 300 boys,—100 in each course of instruction. The boys' stay should be limited to three years, but as the school has only been established upwards of two years, I fancy these arrangements have not been strictly adhered to, particularly with regard to the age of the boys when admitted. The studies are carried on in a number of class-rooms and lecture-rooms, which open into one long corridor. Some of the class-rooms are set apart for the private studies of the boys, so that they can spend their time here if they chose, instead of in play.

A portion of the building is devoted to the study of chemistry, and in the teaching of this science they have one of the cleverest masters in France. He has a large lecture-room fitted up in the same manner as the other lecture-rooms; but it is also furnished with a large laboratory, so that he can give experimental lessons in chemistry, and arrangements are made, by means of a flue, to carry off all noxious gases. He gives lectures on the analysation of wool; and shows the boys how to extract the natural grease, and then to reduce the grease to a solid substance, or otherwise as desired. He also teaches how to wash wool, and the ingredients to be used in order to cleanse it best, and at the same time not injure the fibre or interfere with the lustre. This is taught so that wool may be washed to the best advantage, and in order that each boy may learn what materials to use. In order to arrive at the best result he also teaches dyeing, and he commences first with the prismatic colours. His lecture-room is so arranged that when he wishes he can throw it into complete darkness by means of close-fitting shutters, which, when put up, exclude all the light. By opening a small orifice in one of the shutters he can admit a ray of light which falls upon his table, and directly in front of the pupils upon this table he places a glass prism, and the ray of light falling upon it, throws off all the colours of the rainbow, commencing with the light shades close to the prism, and gradually deepening in colour until it verges into a black shadow. While this is visible to the pupils the master instructs them in the best means of producing those colours on cloth. Afterwards there is a series of lectures on the making of colours, the chemicals to be used, and the application of the dyes to the cloth. Adjoining this lecture-room is one solely used by the master, which contains all kinds of chemical apparatus, and a fine assortment of scales used in weighing the smallest possible substance or liquid. Next to this is a room devoted to the use of the boys. Each boy has a separate portion allotted to him, which consists of a marble stand about 6 ft. by 4 ft., a furnace, water-tap, and a space beneath into which he can put the different things he is using. This arrangement is made so that each boy can follow out his studies without any of the others interfering with him. In this room the boys must analyse wool, or other material, in the manner they have been taught; they must extract the natural grease and solidify it, and then they must wash the wool according to the principle they have been taught; then they must make their own colours from gas-tar or coal-tar. They have a large collection of colours in a glass-case, each colour being kept in air-tight glass-jars. The master told us all these had been made by the boys themselves. Then the boys have given them a bundle of rags, which they must dye according to the colours shown them by the prism. I saw a bundle of these rags dyed by a boy of fifteen, which showed a most beautiful gradation of colour, the light shades being in the middle, and gradually deepening to the edges of the bundle. The arrangement of colour in this case was precisely the same as we often met with in the French section of the Exhibition.

In connexion with this department, the master also gives evening lectures free to all the residents of Rheims. They have also a department devoted to instruction in weaving and the other branches of manufacturing fabrics. Here they have a large number of hand-looms, most of them being small ones, and consequently better adapted for the boys to work. Some of them are furnished with harness and some with heald machines, and nearly all of them have sliding boxes, so that they can weave different colours of weft into one cloth; they have also four power-looms. None of these have been run as yet, but the boys were fitting up the shafting and pulleys, in order to have them running as soon as possible. This department is most perfect in its arrangement, and offers every facility for the boys to learn how to dress the warps and twist them into the healds. It is also furnished with a machine for reading the cards and stamping them, the same as in the other school, all the boys having to make their own designs.

We were also shown into the workshops, and here we received the greatest proof of the usefulness of this school. The first shop was one where joinery and woodwork generally were taught. Some of the boys were engaged in making rifle-stands, and we saw one that was finished. It was made entirely of oak, of very beautiful design, having a hollow place at the bottom for each rifle-stock to rest on; and a niche at the top for the barrel, the whole being inclosed in a very handsome frame, the workmanship being very good indeed. They are taught the use of the rifle, and they were making these stands for their own use. All the boys in this room were engaged in some kind of work; some were planing, some joining, some sawing, and others were turning at lathes,—all of them being under the superintendence of one master. I saw him speak to one of the boys, and the humble manner in which he handed him his plane to inspect was something very refreshing to see.

We then went into a room where practical mechanics are taught. It is fitted up much the same as an ordinary mechanics' shop, having

tools of nearly every description. Some of the boys were engaged in making bench-plates, some were planing them in a machine, and others were filing the surfaces perfectly smooth and true. Any one who understands mechanics will know how difficult it is to make an article of this kind. They were making one for each bench, so that they could at any time test the correctness of any surface they wished to file perfectly evel. At the end of this workshop were two smiths' fires. A boy was working at one of them, making some small articles of iron; and at the other two boys were working, the smith being apparently between fifteen and sixteen years of age, and the striker about fourteen. They were forging a steel screw-key, and placed before them on a bench was a most elaborate full-sized drawing of the key, showing all the angles and curves. This was a most complete work, and the boys had made it themselves before commencing to forge the key. Just behind the forges was a portable engine and boiler, and a youth was keeping up the fires and attending to the engine as well. This engine supplied power to all the workshops, and had been lent to them, as they were showing the one they had made themselves at the Exhibition. In commencing these workshops the authorities just bought as many tools as would make a tool, and then the boys had to make the others themselves as they found the want of them. They show a large number of things made at this school in the Exhibition, the most conspicuous object being the steam-engine before mentioned; they also show a number of models in wood and iron. All these show great skill in construction and workmanship. They also show a number of freehand and mechanical drawings, which display great taste and correctness. They also teach the science of botany, and in order to encourage the boys in this direction, they have a large piece of ground planted with trees, herbs, and flowers, and all these seem to be very well attended to by the pupils. We were kindly presented by the director with a programme of the education given at this school; and according to it, they teach many more things than I have mentioned. In conclusion, I must say that had it not been for the kindness of Mr. Holden, who acted both as guide and interpreter, we could not have seen these schools to the same advantage that we did. He takes a very active part both in the management and support of these schools, and seems quite familiar with their working. The director of the latter school seemed particularly anxious to show us everything of interest in the place, and courteously answered us every question through the medium of Mr. Holden. I forgot to say that in this latter school they have a staff of six professors, and a teacher in each of the workshops."

ST. PAUL'S: ANOTHER VIEW.

Sir,—I have just returned from an inspection of Stevens's design for the decoration of the dome of St. Paul's. I cannot say that I was disappointed, for I did not expect to see more than what I found. Had I expected to see greater things I should have exclaimed, "Can this design be by the man who has recently been bracketed in genius with Michelangelo?" and I should have continued the soliloquy by saying, "If so, this design is quite sufficient to show that he has not the slightest claim to such a position," for its conception is weak in the extreme. The talent that Stevens did possess was that of a certain degree of cleverness in what, I believe, the Italians term *pasticcio* composition. He never struck out an original thought in his life. This design for the dome is no exception. It is a congeries of Michelangelesque bits. It is a design *appliqué*, showing no fundamental mastery in decoration, no connexion with the general design of the building. It is *put on*, and that is all. The same weakness shows itself in the Wellington Monument, in which the canopy is altogether too thin in its quantities, and in which the figures are not a part of the general design, but also *appliqué*. But not only is the design for the dome weak in general conception, but in its subdivisions. The repetition of the circles is puerile in the extreme, and would be fatal to the grandeur of the dome. Sir James Thornhill's design, as a scheme of decoration, is far superior to anything which has recently been put forward. It is simple, and architecturally unites itself with the edifice. Thornhill's arrangement only requires that better pictures should be substituted for those within the arches. These pictures might be executed by Mr. Leighton, and the entire decoration executed in mosaic. Here is a design ready to our hand, and time-honoured,—a design with which no constructive fault can be found. To preserve its main features offers a wise and safe course between "the ills we have and those we wot not of." Let any one conversant with the greatest decorative works stand under the dome and imagine designs by Leighton, *in colour*, substituted for the monochrome figure subjects of Thornhill, and gold grounds, within the arches of the composition, and he will be able to realise the splendour of the effect.

Sir Christopher Wren's own notion of decorating the dome of St. Paul's with mosaics must have been very limited, indeed. It was confined to some arabesques on the ribs which divided the *panelling* of the dome. This panelling will, in all probability, be found filled up, when Thornhill's work is erased. At least, this is the conclusion to which one must come after closely inspecting Emmet's engraving. In this engraving, executed during Wren's lifetime, figure-decorations are exhibited in the spandrels under the whispering gallery; but the figures are not designed, some sideways and some fore-front, a decorative incongruity reserved for more modern illustration in the two mosaics already fixed.

We do not want more light or more aërial tints; more light would destroy the dim religious light and mystery of the dome, and aërial tints would destroy its ponderosity and render it too light in appearance for the structure. A decoration should, in some degree, mask the structure, and lead the imagination away from the bald reality. The height and degree of light will mellow true colouring to its proper aërial gradation.

The decoration of St. Paul's has, nevertheless been materially advanced by the summoning of Messrs. Leighton and Poynter to the work.

Meter.

STEVENS'S DESIGN FOR THE DECORATION OF ST. PAUL'S.

Sir,—Mr. Oldfield, in replying to Mr. Clayton's letter in the *Times* of the 23rd inst., in reference to the alterations proposed to be effected in executing the design by the late Alfred Stevens for the decorations of St. Paul's, makes very startling demands for property-rights in works of art.

Mr. Clayton claimed in his letter that Stevens's design, if used at all, should be adopted in its integrity, and not under some altered shape and motive by which the work would be no longer his.

Mr. Oldfield contends that the design in question was bought unconditionally, and that therefore the right of purchase confers upon the Dean and Chapter rights to alter or even burn as they please. This claim of Mr. Oldfield's is only extraordinary because he ventures to make it. That it would hold good in law there is no doubt, but Mr. Oldfield cannot be unaware that he advocates a right which is honoured in the breach and scorned in the observance.

By such right a Greek statue, say the Venus de Milo, could be pulverised, the Transfiguration scraped to the canvas, and Tintern Abbey blown into the air. The deep sorrow in Europe,—one may say the world,—over the loss of the Peter Martyr in Venice gives us a measure of the execration which would have followed upon the exercise of such rights as Mr. Oldfield claims, had the loss of this picture followed therefrom. As regards the right to alter an art-work, most artists would elect for the alternative right to destroy as the kinder of the two; and, did Mr. Oldfield's views prevail on the subject, artists would anticipate the course he would defend by commissioning their executors to anticipate the right to alter, by taking into their own hands the right to destroy.

Justitia.

The New Gloucester Gate Bridge.—The Duke of Cambridge, as ranger of the Regent's Park, has undertaken to perform the ceremony of opening the New Gloucester Gate Bridge and approaches, which has been carried out by the Vestry of St. Pancras, from designs by Mr. W. Booth Scott, C.E., their chief surveyor. It is understood that his Royal Highness has fixed this Saturday, the 3rd of August, for the ceremony.

ENLARGEMENT OF THE MIDDLESEX SESSIONS HOUSE.

For nearly twelve months past the Middlesex Sessions House, Clerkenwell, has been in the hands of the builders, during which time the building has been very considerably enlarged, by the erection of an additional block on the south side, facing the new thoroughfare called Clerkenwell-road, which has recently been opened as a portion of the new street now in course of construction between Oxford-street and Shoreditch. Whilst the enlargement has been in progress, the existing building has likewise been undergoing extensive internal alterations, the sessions being held at the Westminster Sessions-house until the works are completed, which it is expected will be effected about the commencement of October. The new buildings are 25 ft. in depth, with a frontage to Clerkenwell-road 70 ft. in length, and are upwards of 50 ft. in height. They are built of Portland stone, and in general design are uniform with the old building, the exception being that, instead of a second story, the elevation terminates with cornice and balustrade, carried to a height of about 4 ft. above the heads of the first-floor windows. About one-half of the elevation,—the south-east portion—is octagonal in form, and there is also a return frontage to the east in extension of the east frontage of the existing building, which contains the principal entrance. At the south-west side there is a gateway, enclosed by walls in Portland stone, 12 ft. in height, through which gateway prisoners will be taken to and from the cells, without being exposed to the view of the general public, as has hitherto been the case. The basement portion of the new extension building contains nine cells and the record room. The ground floor contains a committee-room, 24 ft. by 20 ft., together with a number of additional rooms for the clerk of the peace for the county, and his subordinate clerks. The upper floor contains another committee-room, uniform with that below, and also a spacious luncheon-room, the private rooms of the chairmen of the courts, magistrates' retiring-rooms, lavatories, &c.

The courts in the old building are being entirely re-arranged internally, so as to secure increased accommodation and convenience, and the whole of the interior of the building is being thoroughly renovated and re-decorated.

The new buildings have been erected from the designs of Mr. Frederick Henry Pownall, architect to the county; and the works are being carried out under his superintendence. Messrs. Higgs & Hill are the contractors for the new buildings; and Messrs. Patman & Fotheringham are executing all the decorations and other work in the old structure. Mr. Lawrence is the general clerk of works. The entire cost of the works, when completed, will be about 12,000*l*.

STONE BREAKING.

The Savile-street Foundry and Engineering Co., of Sheffield, make a speciality to a great extent of machinery for crushing and pulverising stones, ores, and such like. One of these machines is a novel combination of Hall's "Multiple Action" Machine and Engine, mounted upon a timber frame, on four flanged railway-wheels, and made self-propelling upon the rails, and so constructed as to become, in the hands of a railway contractor, a very useful implement. It will not only move itself at the rate of three to four miles per hour, but will draw a respectable load after it, thus conveying either broken or unbroken stone, ballast, &c., to the place where it will be finally used.

The engine and boiler being distinct from the stone-breaker, and provided with a fly-wheel and additional driving-pulley when necessary, it can be used for driving a mortar-mill, saw-bench, hoisting-gear, or, indeed, any other machinery, and will move itself to any destination.

Before describing the essential difference which characterises this machine from others, we will point out the conditions under which railway lines, turnpike roads, reservoirs, docks, piers, or large sewage outfalls, and, in fact, in all cases where large masses of concrete work are used, are constructed. It not unfrequently happens that large masses of rubble stone or solid rock are met with at various places in the cuttings as the work proceeds, which it is intended to use either as a foundation, ballast, or concrete.

This material must be removed or deposited along the sides of the intended line, where it has hitherto been broken mostly by hand, as it would scarcely pay to fix a machine unless a very large accumulation of stone can be brought together which, after being broken, is deposited along the line. This involves the haulage of all the stone used, amounting to many thousands of tons, both to and from the machine, whereas by this improved method the stone gathered out is broken by the machine and deposited in the centre of the road ready for spreading, saving a great amount of haulage over a large contract, besides which the machine can be used as a locomotive for hauling heavy loads when not otherwise employed.

The stone-breaker is mounted at one end of a timber frame, with at the other a boiler and engine, and arranged with a view to the ends to be obtained, a reversing link motion is attached, with a highly sensitive governor acting on the throttle-valve, and regulating the engine to a uniform speed of 125 revolutions per minute. The self-moving gear consists of a chain pinion running loosely on the crank shaft, with a clutch at the back, operated by a lever from the foot-plate; a steel chain and wheel on a second motion shaft works a pinion, which gears into a spur-wheel on the driving-axle. A sheet-iron awning is placed over the man who fires from between the boiler and stone-breaker.

The machine to which we refer has been invented and patented by Mr. Hall. Instead of one moving face, two are employed, and thus a perfect balance of parts is secured. One half the strain is taken off the machine because only one-half of the crushing area is at work at any one time, as it will be seen that whilst the one jaw retires the other jaw advances, and it is claimed that there is a saving of fully 25 per cent. in the power required to work the machine.

THE STUDY OF ANCIENT ART.

The following memorial has been addressed to the Earl of Beaconsfield:—

"We, the undersigned, being professionally interested in the promotion of higher education in London and its vicinity, beg to represent to your lordship our strong conviction of the importance of giving increased prominence to the study of ancient art as a branch of classical training. As we believe that a museum of casts from the antique would be of very great service for this purpose, especially if provision were made for the delivery of lectures upon the history of Greek sculpture, to be illustrated from the casts and from the collections in the British Museum, we earnestly hope that your lordship may see fit to give your assent to some such scheme as that which we understand has been submitted to you by Mr. Walter Perry and others for the formation of a museum of this nature."

It is signed by twenty-four head-masters, principals, and professors of the colleges and chief schools in London.

CYPRUS AND ITS TIMBER.

Between the two mountain ranges of the Messaria lies a broad tract or plain, extending quite across the island, from the Bay of Famagosta to that of Morphu on the west, through a length of nearly sixty miles, with a breadth varying from ten to twenty miles. The greater part of this plain is open and uncultivated, and presents nothing but barren downs. In antiquity Cyprus was celebrated for its forests, which not only clothed the whole of its mountain ranges, but covered the entire central plain with a dense mass, so that it was with difficulty that the land could be cleared for cultivation. The *Timber Trades Journal* says,—At the present day the whole plain of the Messaria is utterly bare and treeless, and it is only the loftiest and central summits of Mount Olympus that still retain their covering of pine woods. The disappearance of the forests has naturally affected the rivers, which are mostly mere torrents, dry in summer. The ancient forests long supplied the Greek monarchs of Egypt with timber for their fleets. It was the value attached to these forests which, upon the death of Alexander, made Cyprus become an object of contention among his successors. Under Turkish rule, as might be expected, the state of things described above has found no remedy, nor have we any accurate account of the capabilities of the island to produce other wood than that which is indigenous. This, it is to be hoped, will soon be settled, and for the sake of the prosperity of a colony which even in temporary occupation demands the remedy of such an evil, it is to be trusted that the restoration of the forests will be at once commenced. Quick-growing trees should be first planted, and no doubt the eucalyptus will be freely used. In remarking on the wastefulness which has brought about this state of things, one is reminded of what Michelet says of his countrymen, that they were in the habit of cutting down two firs to make a single pair of wooden shoes; and of the time described by St. Pierre, in whose time the planks brought to St. Petersburg were not sawn, but hewn with the axe, and a tree furnished but a single plank. The loss of the forests had reduced the watercourses of Cyprus to mere trickling brooks, often dried up altogether, and this is in obedience to known laws. In America it is always observed that clearing the ground causes running springs to disappear. Lake Valencia, in Venezuela, shrivelled up to an enormous extent, according to Humboldt, from the same cause. Switzerland has sustained a depression of level in her lakes from the too free use of the axe; and Hummel records an instance where, when the annual cuttings reach a certain point, the springs yield less water, and some dry up altogether. Bryant, the American poet, says of the drying up of streams that the cause is the destruction of the forests; "they are drying up," he says, "and from the same cause our summers are growing drier and our winters colder." But space would not suffice to bring forward the array of authorities which might be quoted. Let us hope that the new occupiers of Cyprus will not think the matter too trivial for notice.

PAVING WORKS IN WANDSWORTH-ROAD.

The traffic in Wandsworth-road, from the Vauxhall Railway Station to a little beyond Nine Elms-lane, a distance of about a quarter of a mile in length, is at present almost entirely stopped, owing to the heavy paving works which have for some time been in progress there. The consequence is that the South-Western Railway Company's goods lorries and vans have to approach the company's goods-yard by a very circuitous route, whilst the general traffic is likewise similarly diverted. The whole of the roadway between the points named is being taken up to a considerable depth, and the material carted away, and as the works proceed the foundation of the roadway is formed of a concrete bed, 6 in. in thickness, upon which are laid blocks of granite, 9 in in depth. The works will take some weeks to complete. Messrs. Mowlem & Co. are the contractors.

OBITUARY.

Mr. W. Wyke Smith, solicitor to the Metropolitan Board of Works, died on the 22nd ult., after a few hours' illness, in his seventieth year. During the time when Mr. Woolrych, now one of the metropolitan police magistrates, was clerk to the Commissioners of Sewers and afterwards to the Metropolitan Board of Works, and in his capacity as a barrister acted as legal adviser to those bodies, it was only necessary to refer to Mr. Smith matters which were purely within the province of a solicitor. At the beginning of 1861, however, Mr. Woolrych, who had about fifteen months before resigned the office of clerk to the Metropolitan Board to become its standing counsel, received an appointment as police magistrate, and left the Board without a permanent legal adviser. It was then thought desirable to appoint Mr. Smith as the official solicitor to the Board.

Mr. Alexander Doull, C.E.—Scotch papers announce the death, in his eighty-third year, of Mr. Alexander Doull, C.E., who, while serving with the Royal Engineers, took part in the Survey of Ireland, and after terminating his career in the army, was engaged in engineering works in America, Russia, and other foreign countries.

New Mission-hall, Northampton.—The memorial-stone of a new mission-hall, on the site of the circus in Abington-square, Northampton, has been laid. The architect is Mr. H. H. Dyer. The building will cost 750*l.*, and will accommodate 1,000 persons. Mr. William Poole is the builder.

COPYHOLDS.

DUKE OF RUTLAND *v.* TUTIN.

This action was brought in the Chancery Division, before Vice-Chancellor Sir Richard Malins, by the Duke of Rutland, against Messrs. Tutin & Co., who had purchased a piece of land containing about two acres, forming part of the manor of Ilkeston, in the county of Derby, from a Mr. Hewitt, for an injunction to restrain the defendants from working or interfering with any clay under such piece of land, and the plaintiff claimed to be entitled to all profits gained by the defendants in consequence of their having worked and sold such clay. The defendants contended that they were entitled, under the custom of the manor, to work the clay and to dispose of the same; and they also contended that they had that right under a deed of enfranchisement, dated in 1873.

The Vice-Chancellor said it appeared that Mr. Hewitt, from whom Messrs. Tutin had purchased this land, was one of the copyhold tenants of the manor of Ilkeston, of which the Duke of Rutland was lord of the manor. It was well known that there were many things which a lord of a manor could do and which the tenant of a manor could not do which were at variance with the ordinary rights of a freeholder. This was acknowledged to be so very inconvenient that in the year 1852 an Act was passed to give the tenant of a manor a compulsory power to enfranchise his copyhold; but in the case of a compulsory enfranchisement the 48th section of the Act provided that no enfranchisement under the Act should extend to or affect the estate or rights of any lord or tenant in or to any mines, minerals, limestone, lime, clay, stone, gravel-pits, or quarries within or under the lands enfranchised, or any rights of entry, or other easements of any lord or tenant over the lands, or any powers in respect of property in the soil, which might, but for such enfranchisement, have been exercised for the purpose of enabling the lord or tenant more effectually to search for such minerals, &c. In the year 1873 Mr. Hewitt desired to enfranchise his tenement, and applied to the steward of the manor for that purpose, and the steward agreed that he should be at liberty to enfranchise upon payment of 110*l.* What was the position of Mr. Hewitt? If he had simply been a tenant coming under the Act of 1852 for a compulsory enfranchisement, then, by the 48th section of the Act, all the minerals, including clay, would have been reserved as a matter of course. It was said that there was a custom of the manor under which all the tenants of the manor had a right to dig for clay. There certainly was some evidence which went to show that the tenants had occasionally dug for clay; but there was no evidence to show that the acts were known to the lord of the manor or to his steward. It was possible that, in some cases, the digging for clay by the tenants was of so trifling a nature that it was not thought worth while to interfere; but there was no evidence, in his lordship's opinion, of any such custom, and he was satisfied that the Duke of Rutland had never waived his right, which every lord of the manor had, to the minerals within the land. When Mr. Hewitt applied to be allowed to enfranchise his tenement, there was a deed of enfranchisement executed, by which the property was conveyed to William Hewitt, his heirs and assigns, for ever, to be held as freehold and discharged from all fines, quit-rents, and all other incidents whatsoever of copyhold or customary tenure. If the deed had stopped there, William Hewitt would have had all the rights of a freeholder, and would have had power to work mines; but there was a proviso in the deed that nothing therein contained should prejudice or affect the rights or remedies of the duke or of the lord of the manor for the time being, in respect of any land held of the said manor other than those intended to be thereby appointed and enfranchised, nor any of the rights, privileges, &c., reserved by the 48th section of the Copyhold Enfranchisement Act of 1852. The consequence was that Hewitt agreed that the lord's rights should be preserved exactly in the same manner as if there had been a compulsory enfranchisement of the land, and Hewitt had bound himself to treat the lord of the manor as the owner of the minerals, including the clay. On both these grounds, therefore, both on the evidence as to custom and on the terms of the deed, he was of opinion that there must be an injunction as prayed by the plaintiff, and an inquiry as to the profits made by the defendants, and the defendants must pay the costs of the action.

THE ALLEGED "JOBBING" IN LAND REQUIRED FOR METROPOLITAN IMPROVEMENTS.

The report of the Works Committee of the Metropolitan Board of Works, relating to the connexion of Mr. Joseph Storey (the representative of the parish of St. Luke at the Board) with certain transactions in land required by the Board for metropolitan improvements, was unanimously adopted at the meeting of the Board on the 26th ult. We printed the substance of the report in our last (p. 791). Mr. Storey entered into a long explanation of his action in regard to the purchase and sale of the properties to which the report of the committee chiefly related, and said he challenged the most thorough and complete inquiry into every matter with reference to which his conduct, so far as it was known, was not considered satisfactory. He contended that all his dealings in regard to property in St. Luke's were perfectly legitimate, and without any ulterior motive; that they were carried out in a perfectly open manner, in his own name. He was not afraid of submitting his case to any court in the country; on the contrary, he would gladly welcome the most searching inquiry into his

transactions, and was satisfied that the result would be to vindicate his conduct most thoroughly and entirely. He defied the Board to take legal or other measures to oust him from his position, and contended that, so long as he did not vote or act in any proceedings of the Board relating to property in which he was interested, his conduct was not open to question, either legally or morally. Because he happened to have property which was required for public improvements by the Board, he was not going to "give it" to the public. He asked whether other members of the Board who had had property required for the public had sacrified their private interests for the good of the ratepayers? He contended that the prices asked for the property in the claim sent in to the Board were fair, and was willing to submit the question to arbitration.

BROMPTON ORATORY COMPETITION.

Sir,—I am not surprised that the result of this competition has elicited some correspondence.

It is, of course, no business of the public or the profession how the Fathers spend their money. They are perfectly at liberty either to take advantage of so rare an opportunity and such princely funds to erect a building which shall be emphatically *usui civium decori urbis*,—something on the lines of the Early Renaissance, and recalling the hopes of its vigorous dawn, like our own Gothic revival, to be so soon and so sadly dashed; or they may, if they prefer, erect a building with all the coarseness and vulgarity of St. Peter's or St. Paul's carefully copied, and all their redeeming merits carefully eliminated. True artists may weep,—as they weep over the Albert Memorial, the new Foreign Office, or the New Law Courts,—at magnificent opportunities frittered away on gilding and tinsel, on vulgarity and deformity, or mere masquerading. They may weep, but they must weep in silence. The Fathers spend their own money as they like.

But, sir, the public, and the profession especially, have a right to complain, and are entitled to consider themselves grievously imposed upon when the Fathers advertise for designs, put some thirty members of the profession to an expense of many hundred pounds, and then give the first premium to a design which they have had before them for years, which was published in a journal three years ago, and which I will venture to say they dare not for their own sakes carry out, and which was clearly not suitable to their views, because, having had it before them for three years, they tried to get something more suitable by competition.

If it was adapted to their purpose, why put the profession to such needless expense? They are very hard worked, and very poorly paid, without being the victims of so hollow an invitation as this.

I say, sir, the competitors have a right to complain of a very gross breach of faith,—a breach of faith we expect from town councils and parish vestries, and committees of men trained behind the counter, and growing grey in nepotism and corruption; but such a breach of faith as this we do not expect from the Fathers of the Oratory, who, those who differ most from them in points of faith will cheerfully admit, are men of refined taste and polished gentlemen.

A Competitor.

BOARD SCHOOL COMPETITION, ASHFORD.

In reply to the advertisement in our pages, the Board received twenty-nine designs from various architects in competition. The designs were exhibited to the public at the Assembly Rooms, Ashford, on the 10th ult. The Board had several meetings to consider the designs, and at their last meeting, on the 22nd ult., they decided that the designs bearing the motto "Abécédaire" should be selected for the premium of 20*l.*, and also as the designs for the new schools; and that the author of them, whose name and address appeared, on opening the sealed paper, to be Mr. J. T. Hanson, architect, of York-buildings, Adelphi, London, and of Dover, should be appointed the architect to carry out the designs. The Board also selected the designs bearing the motto "Tuition" for the premium of 10*l.* On opening the sealed paper it appeared the author's name and address were Mr. W. R. King, architect, of Ashford.

THE EPPING FOREST PRESERVATION BILL.

Sir,—The Parliamentary session of 1878 is now approaching its close, having been an important and eventful one, chiefly owing to the complications upon the Eastern question.

Among the minor events is one the possibility of the consequences of which our legislators have yet to learn. On the 4th of July, the Epping Forest Preservation Bill was passed in the House of Commons, which declared that all inclosures made upon it since the 21st of August, 1851, were illegal, and as such liable to be thrown open. As this Act becomes law and is put into force upon all sides of England will arise the same question, as to whether the inclosures that have been made from the roadsides and commons since 1851 are not also illegal; meetings will be held, and bodies of men organised for the purpose of discussing the new Act, and, after giving notice to the owners of the illegal inclosures, will proceed to pull down the fences and re-open the waste lands. When it is considered that since 1851 every county in England has had considerable strips of waste lands taken from the roadsides and added to the local landowners' properties, when the peasantry begin to follow up the Epping Forest Preservation Bill, it will be found in equity that no imprisonment can ensue upon such acts, the precedent of the House of Commons effectually upsetting the laws that have previously guided our judges, as no law can be allowed to exist in one district and not in another. I hope myself, in the interest of order and of reason, the House of Lords will see the necessity of not passing the Act in its entirety, but introduce such amendments concerning inclosures made since 1851 as will prevent the possibility of the Disenclosure Act spreading throughout the whole country; and considering that the majority of our peers and county families have vastly profited by inclosures of land since 1851, calling their attention to the consequences of this Act of the House of Commons may be a means of preventing riotous proceedings, which, if the Bill becomes law, will sooner or later take place.

J. B. Watts.

PUBLIC-HOUSE COMPENSATION CASE.

STEPHENS *v.* METROPOLITAN BOARD OF WORKS.

This was heard at the Sheriffs' Court, Red Lion-square, on Saturday, before Mr. Burchell, under-sheriff, and a special jury.

The claim was in respect of the value of the Geneva Arms, Hayes-court, Soho, which was required by the Metropolitan Board of Works, in connexion with the Piccadilly-circus to Oxford-street improvement. The claimants were Messrs. G. W. & F. R. Stephens, who represented every interest. The claim comprised three principal ingredients,—the value of the property as a freehold, the value of the leasehold interest which Messrs. Stephens had the power to grant, and the value of the fixtures. Finally, there was the usual claim of 10 per cent. upon compulsory purchase. On the part of the claimants, Mr. E. Bailey Haynes, surveyor, said he had surveyed the house, and considered it was worth 80*l.* a year, and that it would fetch that amount of rent upon a thirty-one years' lease. The reversionary interest was worth an extra 500*l.* He estimated the present value of the fixtures at 204*l.* 15s. 8d., making the total value of the property 3,645*l.* He knew that about 800*l.* had been recently laid out upon the premises. He seriously said that the reversion at the end of a thirty-one years' lease was worth 500*l.* He considered the premises in excellent repair. Within a radius of say 100 yards there are ten, or perhaps a dozen, other public-houses. His valuation of the fixtures was a sound one. His valuations had never yet been upset. He adhered to his opinion that at 80*l.* a year rent the house would fetch a premium of 1,000*l.*, and he had been actually offered more than 1,000*l.* if he could obtain the premises at a rental of 80*l.*

Mr. Philbrick addressed the jury for the Metropolitan Board of Works, contending that the claim was excessive.

Mr. William Lovejoy, called as a witness, said he did not think the claimants were entitled to any premium, because he did not believe the house, being surrounded by other licensed houses, was worth a premium. If the licence could be transferred to other premises it would be of some value; but he felt sure the magistrates would not allow the removal of a licence in a district where there were so many public-houses. He considered the rental value, including the licence, to be 60*l.* a-year, to capitalise which at twenty years' purchase would be 1,200*l.* He would add 10 per cent. upon the compulsory purchase, and 100*l.* for fixtures. He had seen the inventory of fixtures prepared by Mr. Haynes, and considered some of them, such as the plate-glass windows, belonged to the freehold, and were not tenants' fixtures at all. He put on 10*l.* a year to the rent as the value of the licence. If the licence could be removed, it would be worth about 500*l.*, but he felt certain that power to remove could not be obtained.

The verdict was 1,900*l.* in full of all claims.

VERITY'S AIR-PROPELLER.

It is quite beyond doubt that there are many times when if a constant supply of fresh air be necessary it must be pumped in,—it will not come in of itself,—and there are places where it can never be obtained without some artificial action. Messrs. Verity Brothers have patented an arrangement to effect this, which is simple and effective. It somewhat resembles in appearance an ordinary gas-meter, and occupies but small space. A cistern placed in the highest available position in the building in which the apparatus is to be used, and a ¾-in. lead pipe conveying the water to the machine, are all that is required. The internal mechanism consists of a drum, with a set of fans worked by a fly-wheel placed in the centre and on the same axis as the fans, which revolves on jewelled centres. Two mere pin-hole jets of water directed on to the fly-wheel put these fans in rapid motion. A current of air may be passed through the machine at the rate of 1,000 ft. per minute and upwards, according to the size of the apparatus; reducing the supply of water by turning the tap, the revolutions may be brought down to three or four per minute, so that the current of air may be regulated to the nicest degree. A couple of machines, placed in proper position and nicely regulated, secure the result of an incoming current of the exact force required and no more, and an extracting power equal to, or greater, than the inlet supply. The water, after working the machine, passes down through minute orifices across the inlet tube, and thus washes the incoming air. The invention is applicable to many wants, and ought at once to come largely into use.

MASTERS AND MEN.

Bristol.—A strike of plasterers commenced in Bristol on Monday. Some time ago they demanded a rise of ½d. per hour. Some of the employers have conceded the advance, but most of the masters refuse to give it, and declare that if the men strike they shall not come in again except at a reduction of ½d. an hour. Thirty men have left the city for other work. The remainder will receive strike pay from the National Association of Plasterers.

Edinburgh.—At an aggregate meeting of the Edinburgh joiners, to consider the bye-laws as recently received from the masters, the following motion was adopted:—"That having heard the code of bye-laws forwarded by the employers for adoption, the meeting regret their inability to accept the same, as they fail to embody any of the recommendations mutually agreed upon at the conference of employers and workmen, and they resolve to adhere to the code adopted at a former meeting of the trade, embodying the recommendations referred to."

Barrhead.—The joiners of Barrhead and neighbourhood received notice from their employers of a reduction of ½d. an hour, to come into effect on the 1st August, making the wages 7½d. an hour.

Proposed Vestry-hall for Bermondsey.—At the last meeting of the Bermondsey Vestry, a report was read from the Vestry-hall Committee stating that it was desirable, in the interest of the proper conduct of parish business, that a Vestry-hall with offices should be provided. The committee pointed out that at present the accommodation for the deposit of parish documents rendered it necessary that they should be placed in different establishments. Mr. Prater moved the reception and adoption of the report, which was carried. It was afterwards resolved that the whole question should be considered at a meeting of the Vestry specially convened for the purpose.

THE BOWER TRAP.

We have seen at Messrs. Smeaton & Sons' the Bower Patent Sewer-Gas Trap in action, and feel justified in recommending it for sinks, lavatories, baths, the overflow of water-closets, and such like. A section of it may have been seen in our advertising columns. A small india-rubber ball, which is floated up to the underside of the inlet-pipe, forms the trap, and as the cup in which it floats is of glass, its satisfactory action can be seen. For some cases, however, it should be said, the cup is made of lead. One very important fact is made clear in watching the specimen set up by Messrs. Smeaton, and that is, the completeness with which the water in an ordinary syphon-trap is drawn out by the action of the water in any other pipe communicating with it. The ordinary trap, as usually put in, will lose nearly all its water-seal by siphonage every time a basin, bath, or water-closet is emptied, and this not only occurs to the trap through which the water has passed, but to all traps on the line of waste-pipe. The form of the Bower Trap is such that it cannot be siphoned enough to break the seal, sufficient water always remaining to float the valve firmly to its seat.

A PROTECTIVE COATING FOR WALLS.

According to the *Thonindustrie-Zeitung*, a Herr W. Reissig has made application for an imperial patent for a new coating of walls, which is affirmed to protect them against penetration by injurious liquids and exhalations, to prevent the formation of fungus, and even to permit the walls to be washed with boiling water. This coating is a spirituous solution of stearate of soda, prepared in the proportion of 50 grammes of stearate of soda dissolved in 1,000 grammes of spirits of wine of a strength of 66 per cent. Besides this preparation, other solutions of soap in spirits of wine of more or less strength may be used; but stearate of soda is to be preferred in cases where expense is no consideration, because it forms a very hard and firm layer, which may be cleaned in the dry way. For stables, spirituous solutions of common brown soap or soft soap suffice; but the stronger the spirits the better. Spirituous solutions penetrate much deeper into the walls than those prepared with water, on account of the little decomposition to which the soap is subjected. The solution may be coloured by direct mixing with dragon's blood, aniline colours, or by direct mixing with a colour producing no decomposition, such as yellow ochre, ultramarine, &c. These coloured coatings are said to look very brilliant. For hospitals, disinfecting substances may be added in solution, which is also important for stables in certain circumstances. The coating will not adhere on oil materials, but it takes well on wood, lime, gypsum, and cement. Size colours are suitably fixed beforehand, a solution, 5 per cent. strong, of chromate of alum especially recommending itself, besides other well-known means. Walls of limestone or other rocks containing lime are hardened beforehand with baryta-water or soluble glass.

The germ of this *invention* our readers have often heard of before.

SHARP PRACTICE.

The Southport Corporation have just advertised in your and several other London professional newspapers for an "Assistant in the Borough Surveyor's Office, who must be an experienced surveyor, leveller, and draughtsman, at a salary of 120*l.* per annum"; but in consequence of the very large number of applicants for this situation they have actually re-advertised the place at 40s. per week.

This is quite a novel and new fashion of taking advantage of these hard times; and, I must add, not creditable to the town, exhibited in all the principal railway stations in the kingdom as the Montpellier of the North.

One Who Unfortunately Applied.

The Artisans' Dwellings Act.—Dr. Dixon, Medical Officer of Health for Bermondsey, has made an official representation, under the Artisans' Dwellings Act, 1875, "that Foxlove-street, Matilda-place, and adjoining houses, courts, and alleys in the neighbourhood, constitute an unhealthy area under the provisions of that Act." The report was received.

CHURCH-BUILDING NEWS.

Bury St. Edmund's.—The decoration of the chancel of St. James's Church, Bury St. Edmund's, has been completed. The work has been executed by Mr. E. Frampton, of London. The space beneath the string-course of the north and south walls is divided into two sections, the lower part forming a dado, which is painted a deep maroon, relieved with diaper work. Above this is a band adorned with holly leaves and berries, the upper edge of which represents a billet moulding. This forms the base of a series of thirty-five canopied panels, each about 5½ ft. high, and these are occupied from the chancel arch to the steps of the sacrarium with representations of the grape, the passion-flower, and the lily; from the sacrarium steps to the east wall the panels are filled with figures of angels, bearing various instruments of music, and representing the heavenly choir.

Alphington.—The parish church of St. Michael's and All Angels, Alphington, was re-opened by the Bishop of Exeter on the 25th ult., after restoration under the direction of Messrs. Hayward & Son, architects, by Messrs. Stephens & Son, builders, Exeter. The walls of the south aisle have been almost entirely rebuilt, the chancel has been lengthened, the piers and arches have been restored to the perpendicular. The roofs of the church are entirely new, the old floor has been taken up, the vaults filled in, and a bed of concrete laid under the new floor to prevent the rise of exhalations from the human remains beneath. The old gallery, which extended across the whole width of the church has been removed, and the tower-arch opened to view. The only other alteration made in the church is the erection of a vestry on the south side, with a loft over it for a large organ. The work of restoration has been carried out in a conservative spirit, every bit of original work that could be preserved having been used again, sometimes at a greater cost than that of substituting new work. The steps in the sacrarium are of Devonshire marble, the floor laid with Godwin's tiles, and the east window is filled with stained glass by Ballantine & Son, of Edinburgh, the gift of Mrs. Hart. The centre light represents the Crucifixion, with an almost opaque background. A single light window, by Mr. Drake, of Exeter, containing the figure of St. Michael, the patron saint, and presented by the architect, is on the north side of the chancel. The two western windows are embellished with stained glass, executed by Ward & Hughes, the gift of the Rev. H. T. Ellacombe. Another stained-glass window, by Beer & Driffield, is in the north aisle. The old-fashioned pews, nearly 5 ft. in height, have been replaced with open seats of pitch-pine, those in the chancel being of black walnut and oak. The upper part of the porch had to be rebuilt, and as there were evident traces of the existence of a former niche, it was determined to build a new one, which has been filled by a statue of the patron saint, executed by Mr. Harry Hems, at the expense and from the design of Lord Devon. The whole of the wood and stone carving, except the statue of St. Michael, has been done by Mr. Sendell, of Exeter. The total cost of the restoration, including the windows and other liberal gifts, will not be less than 4,500*l.*

Melverley.—The ancient parish church of Melverley, on the banks of the Severn, has been re-opened, after restoration. The church is, in plan, similar to a college chapel, and consists of ante-chapel, nave, and chancel, the triple division being formed by two constructional high screens. The porch is on the south side. The quaint open benches, which were almost concealed by modern pews, have been provided with sloping backs, and the simple font, of probably earlier date than the church, is preserved. The nave and chancel have new quarry floors, and the sanctuary is laid with Maw's figured tiles. The chancel is provided with new oak stalls, altar, and altar-rail; and the east wall, under the window, is enriched with a dossal. The sanctuary is raised three steps. The old oak pulpit, which stood on a rubble wall, has been repaired, and fixed on a base formed of carved work found in the church; it now stands on the south side. The gallery over the ante-chapel has been retained, and fitted up with chairs. The restoration has been carried out by Mr. R. Price, of Coleham, under the direction of Mr. Haycock, architect, Shrewsbury, at a cost of a little over 700*l.* The glazing, oiling, and painting were entrusted to Mr. W. Done.

Miscellanea.

Preservation of National Monuments in Ireland.—The Commissioners of Public Works in Ireland, in their annual report, state that the Church Temporalities Commissioners in 1874 vested in that Board fourteen churches, ecclesiastical buildings, and other structures, for future preservation and maintenance, and in order to meet the cost of placing these ruins, as far as possible, in a state of security against further dilapidation, and to supply a fund for their subsequent preservation, these Commissioners transferred to the credit of the Board 22,554*l.* During the past year, after careful inquiry, they made choice of 105 additional structures, which, out of a multitude of cases, appeared to be the most deserving of being preserved as monuments of national or historic value and importance, and vested them in the Board for future maintenance. They also transferred to the credit of the Board 27,446*l.*, making in all 50,000*l.* to be applied in repairing and maintaining the 119 churches, ecclesiastical buildings, and other ancient structures selected for preservation. Up to the present the works have been completed at the Rock of Cashel; seven churches: Glendalough, Ardmore, Ardfert, Monasterboice, Devenish Island, St. Columb's House (Kells), and Donaghmore. Works are now in progress at Movilla, Ardtoke, St. John's Point, Loughin's Island, Maghera, Kilmacduagh, and Howth Abbey.

New Nisi Prius Court at Chester.—On the 25th ult. a new law-court was opened at Chester by Lord Justice Coleridge. For many years the inconvenience and bad ventilation of the old court have been very much felt by all who had business there. As no cure for these defects was to be had, the magistrates of the county decided to provide better quarters. They called in the services of Mr. T. M. Lockwood, architect, Chester, who prepared the plans for the new court. The arrangement of the court itself is on a plan very much like that of the courts in Strangeways, Manchester. The order adopted is the Doric; pilasters of that order divide the walls into compartments. Along the top of the pillars runs an entablature, above which are a series of semicircular arches forming recessed panels in the wall, and from above these the roof is carried. The deep framing of the roof leaves, by sub-division, eight octagon glass panels, tinted and filled with the arms of Hugh Lupus, first Earl of Chester, in the same style as the glass ceiling of the House of Commons. All the fittings of the court are of carved and polished oak. The builder is Mr. Samuel Warburton, of Manchester. The cost has been about 12,000*l.* The building is situated in the Castle-yard.

Memorial Fountain at Hurstpierpoint. The little market-town of Hurstpierpoint, Sussex, has just been favoured with a gift in the shape of a fountain, designed to perpetuate the memory of Mr. H. Holman, who died last year. The fountain, which has been set up by the sons of the deceased on the church green, has a height of 17 ft. 3 in., and it is built of Cornish granite, finely picked. The width at the base is 7 ft. 8 in. by 2 ft., there being a cattle-trough 6 ft. 8 in. by 3 ft. 4 in., and 2 ft. 6 in. high, which alone weighs 2 tons, the weight of the whole fountain being 12 tons. The whole of the granite was brought by ship into Southwick, and thence conveyed to Hurst. The fountain is surmounted by a cross of granite. On the south-west side is the fountain, the water issuing from a lion's mouth, and the waste goes into a dog-trough at the base. It is supplied by the Metropolitan Drinking Fountain and Cattle Trough Association, and the whole of the work has been carried out under the superintendence of their foreman, Mr. R. D. Gibbs.

Newport Pagnell.—In consequence of the increasing consumption of gas in the town, the Newport Pagnell Gas Company decided to erect, at their works in Caldecote-street, a large holder capable of containing about 18,000 ft. of gas, in addition to the two at present in use. The tank for this holder, which was commenced in April last, having been completed, all the men engaged in the work were lately invited by the manager of the company's works, Mr. James Whitmee, to a capital spread. The tables were laid in the tank, which, although a somewhat novel supper-room, was most suitable and convenient, the weather fortunately being fine.

Artisan-Reporters on the Paris Exhibition.—The joint committee of her Majesty's Commissioners and of the Society of Arts for promoting visits of selected artisan-reporters to the Paris Exhibition have now completed the arrangements under which artisans will be sent to Paris. Each artisan is expected to devote from eight to fourteen days to the visit. He will be paid 8*l.*, out of which he must pay all charges connected with his trip. Free admission to the Exhibition will be granted. Arrangements have been made with the South-Eastern and London, Chatham, and Dover Railway Companies for the purchase of a return ticket to Paris and back, available for fourteen days, at the price of 20s. Lodgings have been provided at a reduced scale, and arrangements have been made for obtaining meals also at reduced charges. Besides the artisans selected by the joint committee, artisans may be sent at the expense of their employers or local committee. Such artisans will be supplied with the necessary cards and certificates to enable them to take advantage of arrangements and facilities afforded by the joint committee. Employers or local committees subscribing to the fund may select or send out artisans in number to the extent of one for each 10*l.* subscribed, or subscribers to the fund may nominate for consideration and selection by the joint committee such artisans as they may think suitable to represent the special trade or trades of the district or party subscribing. Subscriptions are sought from local committees, individual firms, or employers to enable the joint committee to carry out the undertaking on a complete and successful scale.

Birmingham Sewage.—At the last meeting of the Solihull Sanitary Authority, the inspector of nuisances drew attention to "an abominable nuisance" caused by the Corporation of Birmingham at the wharf near Henwood Mill, in the parish of Solihull, by the deposit of night-soil and other offensive matter. Many thousands of tons of night-soil were, he said, deposited on the land. The pan manure, or clear excreta, was brought up in boats, and the liquid matter was allowed to run into the mill-dam or river Blythe. The smell was most offensive, and the river, which formed part of the Birmingham water supply, was to a great extent polluted. A fatal case of typhoid fever had occurred at the mill. The clerk read a report which he had received from Dr. Wilson, the Medical Officer of Health, on the same subject. After a careful investigation he was convinced that there had been a serious pollution of the neighbouring stream by soakage from the manure heaps, and that such a pollution would in all likelihood recur after heavy falls of rain, and that the abominable stench from the excremental matter contained in the heaps, and which was in a semi-fluid condition when deposited, constituted a nuisance highly dangerous to health. There was every reason to believe that the nuisance had been the cause of grave and repeated illnesses, one of which had terminated fatally. Mr. Lewall, resident engineer on the Solihull Sewerage Works, also made a report on the subject, in which he stated the quantity to amount to 5,000 tons, and that the smell was most offensive, and could be perceived at a distance of a quarter of a mile. The Board instructed the clerk to write to the Corporation of Birmingham, calling upon them to abate the nuisance forthwith.

The Liverpool School Board have accepted the tender of Messrs. Brown & Backhouse for the erection of schools for 1,060 children in Clint-road. The schools are from the designs of the architect to the Board, Mr. T. Mellard Reade. They consist of four departments; the infants and mixed juniors being on the ground floor, and the senior boys and senior girls on the first floor. The principal façade is to the north, the plan being of a ⊥ form. A plunge-bath is provided in the basement. The playgrounds are spacious, being the largest of any of the Liverpool Board schools. Ten feet and a half superficial per child is allowed for floor space. The contract amounts to 9,090*l.*, or 8*l.* 11s. 6d. per head.

Hints as to Colour in Schoolrooms.—Dr. Willard, of the Chicago High School, declares that schoolroom walls, for the sake of the pupils, should be tinted with a pinkish, greenish, or bluish tinge, and that the "blackboards" should be green, brownish, or drab in colour. He adds that it is a mistake to think that the board must be black to make the chalk-mark distinct.

The Proposed Bradford Art-Gallery and Museum.—On the 24th ult. a meeting of the Free Library and Art-Gallery Sub-Committee was held in the Mayor's Parlour, at the Bradford Town-hall, for the purpose of meeting Sir Herbert B. Sandford, assistant director of the Science and Art Department, South Kensington, who visited the town for the purpose of making inquiries with reference to the proposed Art-Gallery and Museum. After explanations had been given as to what was proposed, the meeting adjourned to the large room over the Free Library in Darley-street, where it is intended to place the Art Gallery. Sir Herbert Sandford closely examined the room and its approaches, and will report upon it to the South Kensington Museum authorities. In order to enable him the better to do so, Mr. Virgo, the librarian, furnished him with the architect's plans.

Bucks Archæological Society. — The members of this society had their annual excursion on the 22nd ult. Leaving Aylesbury shortly after nine o'clock, they proceeded to Bourne End, receiving additions to their number at the different stations on the way. On arrival carriages were there waiting to take the party to Hedsor, Cliveden, Burnham Abbey Church and Beeches: Dropmore Church, through Dropmore Park to Woburn, where the party partook of the hospitality of Mr. A. Gilbey. After proceeding to Bourne End, a lengthened halt was made at the residence of Lord Boston, where the chief historical objects and architectural features of the mansion were inspected, Burnham, Hedsor, and the beauties of Cliveden also receiving particular attention; and at Woburn a paper was read on the antiquity of the church, the first records dating from the year 1300.

Ayr.—A new wet dock has been opened at Ayr. The contract price of the dock, the construction of which was commenced about four years ago, was 132,000*l.* The extent of water is in all about seven acres and a quarter, the range of tide, 10 ft.; depth of water, 22 ft.; length of dock, 650 ft.; average breadth, 450 ft. One of the principal features of the work has been the reclamation of land from the sea. Thirty acres were reclaimed, and a site thus provided for the dock, quays, sheds, &c.

Thames Valley Sewerage.—Mr. Buchanan' C.E., has been appointed to provide the members of the Lower Thames Valley Main Sewerage Board with a complete analysis of the various schemes sent it for dealing with the sewerage of the united district, but he is to refrain from giving any opinion as to the merits or demerits of the respective plans. His remuneration for the work is not to exceed 100 guineas.

Business Premises, Banbury.—The new building in the High-street, Banbury, on the site of the old "Star," is approaching completion. It is faced with Pether's patent bricks. The whole of the work has been carried out by Mr. A. Kimberley. A new house and shop have been erected for Mr. Merry in Calthorpe-street. Mr. A. Kimberley is also the builder engaged in this work. Mr. W. E. Mills designed both buildings.

The late Joiners' Strike in Manchester.—At the Manchester Assizes last week, before Lord Chief Justice Cockburn, the case of Last *v.* Goodwin and others was settled. The plaintiff sued the defendants, as trustees of the Joiners' Union, for damages, on the ground that he had been wrongfully dismissed from his post as secretary of the union during the strike. The jury, by direction, returned a verdict for the the plaintiff, with 100*l.* damages.

The Institute of Painters in Water Colours.—A great move will shortly be made here. It is proposed to erect a new building for the purposes of the Society, with greatly increased means of accommodation, and a plot of land in Piccadilly, opposite the end of Sackville-street, is already secured. The project will probably be carried out by means of a small company.

The Designs submitted by Messrs. O. Edwards and W. Owen, of Manchester and Rhyl, have been selected in limited competition for a new Baptist chapel and schools, to be erected at Bowden, Cheshire. The chapel is to seat 500 persons, and to cost about 2,000*l.*, and will be built in the Italian style of architecture.

TENDERS

For the formation of sewer, and carriage and footways in connexion therewith, in the line of the Bethnal Green Improvement, new street between High-street, Shoreditch, and Gibraltar-gardens, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Ward & King	£25,000 0 0
Cook & Co.	21,763 6 0
Stevens & Co.	21,300 0 0
Webster	19,970 0 0
Crockett	19,900 0 0
Mowlem & Co.	19,500 0 0
Nowell & Robson (accepted)	19,490 0 0
Cardos	18,839 0 6

For providing additional pumps at the Crossness and the Effra and Falcon Brook storm outlets, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Eastons & Anderson (accepted)	7,700 0 0

For Contract No. 1,—the erection of proposed new soap factory, at North Woolwich, for Messrs. John Knight & Sons, consisting of stabling for forty horses, foremen's cottages, fat and packing houses, chimney-shafts, roads, paving, and concrete foundations. Messrs. Tunley & Boyle, architects. Quantities supplied:—

Cooke & Co.	£22,037 13 8
Sabey & Son	20,584 0 0
Cullum	19,995 0 0
Merritt & Ashby	19,333 0 0
Baker & Son	19,331 0 0
Sawyer	18,500 0 0
Hook & Oldrey	18,350 0 0
Crockett	18,317 0 0
Aitchison & Walker	18,256 0 0
Brass	18,244 0 0
Kirk & Randall	17,690 0 0
Dickinson	17,563 0 0
Cowland Bros.	17,486 0 0
Martin	17,480 0 0
French	17,450 0 0
Sheffield & Prebble	16,873 0 0
Prout	16,546 0 0
Perry & Co.	16,400 0 0
Vernon & Ewens	16,272 0 0
Brealy (withdrawn)	16,200 0 0

For works, cleaning, &c., at Marylebone Infirmary:—

Hill	£315 0 0
Taylor & Capel	117 16 9
Britten	95 10 0
Lemon	95 0 0
Sherman (accepted)	92 0 0

For additions and repairs to parish church, Codford St. Mary, Wiltshire:—

Hopkins & Sons	£1,123 10 0
Giles	1,109 0 0
Coleman Bros.	1,077 0 0
Stephens & Bastow	1,075 0 0
Burgess	1,013 11 0
Gaisford	999 12 0
Harris	988 0 0
Balcombe (accepted)	978 13 0

For alterations to Baptist chapel, Ripley, Derbyshire Mr. R. Argile, architect. Quantities supplied:—

Fletcher	£970 0 0
Clark (accepted)	662 10 0

For house and buildings, on the Northern Sewage Farm, Ripley, Derbyshire, for the Ripley Local Board. Mr. R. Argile, architect. Quantities supplied:—

Oldersham	£680 0 0
Warren	470 0 0
Fletcher	450 0 0
Wetton	440 10 0
Clower	412 0 0
Jackson	400 0 0
Wyld (accepted)	385 2 0

For the erection of engine, meter, and boiler houses, smith's shop, chimney-shaft, &c., for the Lea-bridge District Gas Company. Mr. E. H. Thorman, engineer:—

Bangs	£1,987 0 0
F. F. & J. Wood	1,983 0 0
Reed	1,928 0 0
Falkner	1,837 0 0
Crabb (accepted)	1,750 0 0

For cleaning and painting works at Christ's Hospital, Newgate-street. Mr. H. S. Legg, architect:—

Harrisson & Wood	£973 0 0
Patman & Fotheringham	823 0 0
Pitman & Cuthbertson	720 0 0
Morby & Company	687 0 0
Hayward & Son (accepted)	670 0 0

For carcassing presbytery, adjoining the Church of St. Patrick-in-the-East, for the Rev. Angelo Lucas. Mr. F. W. Tasker, architect. Quantities by Messrs. Batterbury & Huxley:—

Bangs	£1,230 0 0
Patman & Fotheringham	1,150 0 0
Aviss	1,140 0 0
Vulbey	1,100 0 0
Nightingale	1,097 0 0
Linzell & Son	1,000 0 0

For three houses at Bishopwood-road, Highgate, for Mr. W. Piper. Messrs. Batterbury & Huxley, architects:—

	For one House only.
Conder	£9,627 0 0 ... £3,297 0 0
Greenwood (too late)	9,500 0 0 ... 3,337 0 0
Nightingale	9,398 0 0 ... 3,298 0 0
Lathey Bros.	9,253 0 0 ... 3,231 0 0
Gould & Brand	9,200 0 0 ... 3,193 0 0
Linzell & Son	9,000 0 0 ... 3,330 0 0
Sharman	8,800 0 0 ... 2,990 0 0
Wise (withdrawn)	8,490 0 0 ... 2,900 0 0

For erecting first portion of the Church of St. Patrick-in-the-East, Wapping, for Cardinal Manning. Mr. F. W. Tasker, architect. Quantities by Messrs. Batterbury & Huxley:—

Patman & Fotheringham	£4,450 0 0
Aviss	4,447 0 0
Nightingale	4,332 0 0
Linzell & Son	4,289 0 0
Bangs	4,289 0 0
Vulbey	4,148 0 0

For pulling down and rebuilding Wycliffe Chapel Schools, Philpot-street, Commercial-road, E. Mr. J. Hudson, architect. Quantities supplied by Mr. Stanger:—

Read & Son	£3,620	0	0
Moyle & Son	3,512	0	0
Jacobs	3,480	0	0
Ashby & Horner	3,476	0	0
Little	3,289	0	0
Hearle & Son	3,282	0	0

For reseating St. James's Church, Hampstead-road. Mr. Rogers, architect:—

Ball & Wicks	£197	0	0
Titmas	180	17	6
Wagner	168	0	0
Blandford	163	0	0
Somerville & Hill (accepted)	154	0	0

For painting and other repairs at the Homerton Small-Pox Hospital, for the Managers of the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects. No quantities:—

F. G. & R. Vigor	£1,257	0	0
Bishop	1,250	0	0
Wythe (accepted)	870	0	0
Cook & Co.	663	0	0

For a house and offices at Farley-hill, Swallowfield, Berks, for Mr. William Simonds. Mr. W. Ravenscroft, architect. Quantities by Messrs. Cooper & Son:—

	Brown Portland Stone, extra.			Part deal in Joinery, less.		
Wheeler Bros.	£8,724	0	...	—	...	—
Higgs	8,686	0	...	£405	0	... £498 10
Rider & Son*	8,578	0	...	580	0	... 1,000 0
Woodroffe	8,558	0	...	480	0	... 576 3
Filiwood	8,390	0	...	395	0	... 727 0

* Accepted, using part deal instead of oak in joinery, and with Bath stone dressings.

For alterations and additions to the Golden Lion, Copenhagen-street, Islington, for Mr. Ridler. Mr. Miller, architect:—

Adams	£1,174	0	0
Beale	980	0	0
Anley	890	0	0
Lamble (accepted)	879	0	0

For building a lodge at Hayling Park, Croydon, for Mr. James Watney. Mr. H. J. Newton, architect:—

Dove Bros.	£1,455	0	0
Goden	1,439	0	0
Lamble (accepted)	1,277	0	0

For new Baptist chapel, North-end, Finchley. Mr Morton M. Glover, architect:—

Staines & Son (accepted)	£3,587	13	0

Accepted for restoration of Great Salkeld Church, Cumberland. Messrs. Hetherington & Oliver, architects:—
Hindson & Graham (masons).
Court Bros. (joiners).
Porter & Dixon (plumbers, painters, glaziers, &c.).

For new Centenary Congregational Church, Lancaster. Messrs. Hetherington & Oliver, architects. Quantities by Mr. G. Connell:—

Briggs & Lancaster (mason)	£2,310	0	0
Wright (joiner)	1,193	6	0
Hartley (slater and plasterer)	215	13	0
Calvert & Heald (plumbers, &c.)	257	4	0
Meadowcroft (painter)	120	11	0
Trustees of the late Edmund Sharpe (smith and ironfounder)	140	0	0

For new schools for 800 children, at Edinburgh-road, Notting-hill, for the London School Board. Mr. Robson, architect:—

Shepherd	£9,450	0	0
Adamson & Son	9,279	0	0
Thomas	8,820	0	0
Higgs & Hill	8,734	0	0
Grover	8,622	0	0
Scrivener & Co.	8,566	0	0
Hobson	8,557	0	0
Wall Bros.	8,451	0	0
Tongue	8,444	0	0
Rankin	8,430	0	0
Hook & Oldrey	8,395	0	0
Stimpson & Co.	8,159	0	0

For additions to Epperstone Avenue-road, Leamington, for Dr. Otho Wyer. Mr. George Hart, architect:—

Sheasby	£259	0	0
Rolf	205	0	0
Bird (accepted)	205	0	0

For additional buildings to Belvedere Works, Johnstreet, Pentonville, for Messrs. Symmons & Sons:—

Beaves (accepted)	£2,575	0	0

For alterations and additions to the Bedford Head, Tottenham-court-road, for Mr. Wood. Quantities supplied by Mr. H. Pollard:—

Scrivener & Co.	£4,964	0	0
Goodman	4,897	0	0
Patrick & Son	4,260	0	0
Lawrence	3,980	0	0
Clemence	3,867	0	0

For erecting two villa residences on the Woodcote Estate, Wallington, Surrey, for Messrs. Parker and the Freeholders. Mr. E. P. Loftus Brock, architect:—

Julian & Co.	£3,650	0	0
Brass	3,500	0	0
Potterton	3,390	0	0
Lose	3,320	0	0
Jarrett	3,050	0	0
Mattock, Bros.	2,993	0	0
Bish	2,800	0	0
Howe & White	2,350	0	0

For the erection of pantechnicon and two houses, in the Station-road, Camberwell, for Mr. W. Harriss. Mr. John Farrer, architect:—

Julian & Co.	£4,400	0	0
W. & E. Nottle	4,400	0	0
Taylor	4,393	0	0
Thompson	4,334	0	0
Conder	4,297	0	0
Holliday	4,265	0	0

For erection of a mixed school and mistress's house, at Borley, Essex, for the Borley and Lyston School Board. Mr. Samuel Knight, architect:—

Grimwood & Sons (accepted)	£795	0	0

For erection of three model cottages at Roehampton, Surrey, for Mr. E. A. Hambro, built of cement concrete, faced with red Broomhall tiles. Mr. Samuel Knight, architect:—

Sutton (accepted)	£1,000	0	0

For erection of new premises, 112, Fleet-street, for Messrs. Brentini. Mr. Samuel Knight, architect. Quantities by Mr. G. Fleetwood:—

Colls & Son	£3,470	0	0
Patman & Fotheringham	3,190	0	0
Nightingale	3,177	0	0
Shepherd	3,175	0	0
Downs & Co.	3,140	0	0
Roberts & Co. (accepted)	2,979	0	0

For the erection of St. Peter's Church, Upper Holloway. Mr. C. L. Luck, architect. Quantities supplied by Messrs. Northcroft, Son, & Neighbour:—

Adamson	£8,140	0	0
Harris & Co.	7,994	0	0
Boyce	7,728	0	0
Hill & Higgs	7,560	0	0
Stevenson	7,539	0	0
Lawrence	7,438	0	0
Wall Bros.	7,415	0	0
Scrivener & Co.	5,675	0	0
Clemence	5,590	0	0
Wheeler	5,415	0	0

For the erection of a villa residence at Epping, Essex, for the Misses Symondson. Mr. John Hudson, architect. Bricks provided:—

Field & Son	£1,400	0	0
Reed	934	0	0
Bentley	888	0	0

For repairs and alterations at Nos. 29 and 30, King-street, Tower-hill. Mr. John Hudson, architect:—

Outhwaite & Son	£212	0	0
Sparks	193	0	0

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J. J. W. *Antwerp* (next week. Send photograph, &c.).—Sanitary Inquirer (animal charcoal is desirable).—P. (if you have not confidence in your architect get another. We, certainly, will not assist you in trying to trip him up).—W. C. T.—D. B.—E. W.—M. M.—S.—R.—J. C. R.—H. B. G.—S. G.—G. S. & Co.—M. & Son.—J. R. C.—A. & B.—T. C. N.—J. B. W.—W. W.—R. A. jun.—C. H.—W. R.—D.—J. H.—B. M.—H. Bros.—J. K. C.—E. L. B.—G. F. D.—T. W. B.—J. F.—G. J. S.—T. M. R.—E. & O.—S. & Co.

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